

AN EMPIRICAL MODEL OF EXCEPTIONAL TEACHING

by

JEFFREY LORNE MITCHELL

BA(hons) Psychology
University of Winnipeg 1988

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

Doctor of Philosophy

in

THE FACULTY OF GRADUATE STUDIES

EDUCATIONAL PSYCHOLOGY AND SPECIAL EDUCATION

We accept this thesis as conforming

to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

1995

© Jeffrey Lorne Mitchell, 1995

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

(Signature)

Department of Educational Psychology + special Education
The University of British Columbia
Vancouver, Canada

Date May 3, 1995

ABSTRACT

Ideas from philosophy, developmental psychology, cognitive psychology, and teacher education are molded into a description of exceptional teaching. Especially important for establishing a model of exceptional teaching is Habermas's (1970) theory of *knowledge-constitutive interests*. Specifically, Habermas's three knowledge-constitutive interests (technical, practical, and emancipatory) are expected to define *wisdom in teaching*. By adopting technical, practical, and emancipatory knowledge as the basis for a model of exceptional teaching this study will extend some current descriptions of exceptional teaching (i.e., Berliner, 1986) that define exceptional teaching as *expertise*. Evidence for this conclusion stems from the results of a principal components analysis on respondents' ratings of descriptors of "wise" teaching, as compared to the results from a principal components analysis on respondents' ratings of descriptors of "expert" teaching. Wise teaching seems to involve all three of Habermas's ways of knowing, whereas, "expert" teaching involves practical and especially technical ways of knowing. Therefore, the difference between "wise" and "expert" teaching seems to be in what Habermas has called emancipatory knowing. A second set of findings supports the above findings by showing that teachers hypothesized to be closer to the prototype of a wise teacher (department heads) utilize their "wisdom" in response to two general questions about education; whereas, a sample of teachers who were not department heads and a sample of student teachers do not utilize these

three ways of knowing to the same extent. The difference between the three samples of teachers was primarily in the use of emancipatory knowledge by the department heads. In a third set of findings a teacher hypothesized to be "wise" was observed to determine whether or not Habermas's three ways of knowing were evident in her teaching practice. This was found to be the case. The general conclusion from the present study is that a comprehensive description of exceptional teaching seems to be possible based upon people's everyday conceptions of what it means to be a "wise" teacher. Thus, an empirical model is provided for future research on exceptional teaching. This empirical model seems to best fit into a developmental framework based on constructivism because the essence of constructivist descriptions of exceptional teachers (e.g., Arlin, 1993; Lee, 1993; Prawat 1992) correspond closely with the present description of exceptional teachers.

TABLE OF CONTENTS

Abstract.....	ii
Table of Contents.....	iv
List of Tables.....	vii
List of Figures.....	viii
Acknowledgments.....	ix
I. INTRODUCTION.....	1
A. Background of the Problem.....	1
1. Exceptional Teaching as Wisdom.....	1
B. The Problem.....	14
C. Justification of the Study.....	15
II. REVIEW OF THE LITERATURE.....	19
A. Structure of the Review: Research on Three Ways of Knowing.....	19
B. A Historical Perspective on Wisdom.....	20
1. Evidence for Technical Ways of Knowing.....	22
i. Exceptional teaching as expertise: An information processing view.....	22
ii. Questioning the expertise metaphor: Information processing literature revisited.....	27
iii. Exceptional teaching as expertise: A developmental view.....	34
iv. Summary.....	43
2. Evidence for Practical Ways of Knowing.....	44
i. Evidence for practical ways of knowing: General research.....	45
ii. Summary of general research on practical knowing ..	52
iii. Evidence for practical ways of knowing: Developmental research.....	52
3. Evidence for Emancipatory Ways of Knowing.....	58
i. Evidence for emancipatory ways of knowing: General research.....	58
ii. Evidence for emancipatory ways of knowing: Summary of general research.....	62
iii. Evidence for emancipatory ways of knowing: developmental research.....	62
C. Research Indicative of Technical, Practical, and Emancipatory Knowing.....	69
D. Summary of Research Pertaining to Technical, Practical, and Emancipatory Ways of Knowing.....	75
E. Assumptions of the Study.....	76

Table of Contents

F.	Delimitation of the Study	77
G.	General Research Question and Specific Research Hypotheses	78
1.	General Research Question Revisited	78
2.	Hypothesis Ia	78
i.	Rationale for hypothesis Ia	79
3.	Hypothesis Ib	84
i.	Rationale for hypothesis Ib	84
4.	Hypothesis IIa	84
i.	Rationale for hypothesis IIa	85
5.	Hypothesis IIb	85
i.	Rationale for hypothesis IIb	85
6.	Hypothesis III	85
i.	Rationale for hypothesis III	86
7.	Hypothesis IV	86
i.	Rationale for hypothesis IV	87
8.	Hypothesis V	88
i.	Rationale for hypothesis V	88
9.	Summary of the Hypotheses	89
III.	METHODOLOGY.....	91
A.	Overall Design and Analysis of the Study	91
B.	Phase 1	93
1.	Design of Phase 1	93
i.	Participants: Step 1	93
ii.	Measuring instruments and procedure: Step 1	94
iii.	Participants: Step 2	95
iv.	Measuring instruments and procedures: Step 2	96
v.	Analysis: Step 2	96
C.	Phase 2	98
1.	Design of Phase 2	98
i.	Participants	99
ii.	Empirical Questions for Phase 2	100
D.	Phase 3	100
1.	Design for Phase 3	100
i.	Participant	101
ii.	Procedure	101
IV.	RESULTS.....	103
A.	General Findings	103
B.	Phase 1 Findings	103
1.	Generating Attributes: Setting the Stage	103
2.	Reliability of the Scales	111
3.	Validity of the Scales	111
4.	Descriptive Statistics	113
5.	Relationship between Step 1 and Step 2 Ratings	116
6.	Principal Components Analysis: Wisdom Scale	117
7.	Principal Components Analysis: Expertise Scale	125
8.	Comparison of the Wisdom and Expertise Scales	130

Table of Contents

C. Phase 2 Findings	139
D. Phase 3 Findings	146
V. DISCUSSION.....	157
A. Summary of Results	157
B. Discussion of Specific Findings	157
1. Technical	158
2. Practical	160
3. Emancipatory	162
C. Fitting the Present Notion of Exceptional Teaching into a Theoretical Perspective	163
D. Fitting the Present Results into Constructivist Theory	165
E. An Empirical Model of Exceptional Teaching: Exceptional Teaching as Wisdom	170
F. Conclusion	175
G. Possibilities for Future Research	176
VI. REFERENCES.....	178
VII. APPENDIX A.....	193
A. Expertise Descriptors in Descending Order	193
B. Wisdom Descriptors in Descending Order	197
VIII. APPENDIX B.....	202
A. Wisdom in Teaching Scale	202
B. Expertise in Teaching Scale	208
IX. APPENDIX C.....	214
A. Correlation Matrix for the Wisdom Scale	214
B. Correlation Matrix for the Expertise Scale	215
C. Rotated Component Loading Matrix for the Wisdom Scale	216
D. Rotated Component Loading Matrix for the Expertise Scale	218

LIST OF TABLES

Table 1: Overlapping Descriptors of "Wise" and "Expert" Teachers.....	106
Table 2: Age Characteristics of Phase 1 Participants (step 1 & 2)....	113
Table 3: Descriptive Statistics for the Wisdom and Expertise Scales..	114
Table 4: Rotated Components for Wisdom.....	118
Table 5: Rotated Final Components for Wisdom.....	122
Table 6: Rotated Components for Expertise.....	126
Table 7: Rotated Final Components for Expertise.....	129
Table 8: Overlap Between Descriptors that Formed Interpretable Components	131
Table 9: t-tests among Components on the Wisdom Scale.....	134
Table 10: t-tests among Components on the Expertise Scale.....	136
Table 11: t-tests among components across the expertise and wisdom Scales	138

LIST OF FIGURES

Figure 1a: Graphical Representations of Habermas's Theory of Knowledge- Constitutive Interests	9
Figure 1b: Graphical Representations of Habermas's Theory of Knowledge- Constitutive Interests	10
Figure 1c: Graphical Representations of Habermas's Theory of Knowledge- Constitutive Interests	11
Figure 2: Studies that Employ the Implicit Theories Approach to Study Wisdom	81
Figure 3: Overview of the Design.....	92
Figure 4: Ways of Knowing as Evidenced in Three Levels of Teachers' Responses to a Question Concerning Learning	141
Figure 5: Ways of Knowing as Evidenced in Three Levels of Teachers' Responses to a Question Concerning Teaching	142

ACKNOWLEDGMENTS

On this journey there are those whom I owe my sincerest gratitude. I would first like to thank my committee members Dr. Kim Schonert-Reichel, Dr. Nand Kishor and especially Dr. Pat Arlin. Much more than providing the guidance that was necessary for me to complete this thesis, Dr. Arlin was and is the person whom I looked to as the primary role-model for my professional development.

I would also like to thank Mat Cadez, Sherry Glutyk, Darren McClelland and Arleigh Reichel for their help. Each of these people gave their time to help me produce a better quality thesis and for that I am grateful.

On a personal level I would to thank my mother, brother, and two sisters. As well as my best friends Al, John and Tom. Their encouragement gave me strength at difficult times.

Most important I would like to thank my wife Sherry who has unconditionally supported me throughout my schooling. Her confidence in me never wavered. It truly is understatement to say that any success I have had in completing my programme is due to my wife . Let these words be a testament to the love I have for Sherry.

I. INTRODUCTION

A. BACKGROUND OF THE PROBLEM

Notions of wisdom comparable to the one that will be empirically tested in the present study have been in the discourse of history for at least 2000 years (Robinson, 1990). For example, Plato in his dialogues describes *sophia*, *phronesis*, and *episteme* as three forms of wisdom, with wisdom in the form of *sophia* and *phronesis* transcending the cognitive form of wisdom (*episteme*). Socrates, Plato's teacher and Aristotle, Plato's student, also had their particular conceptions of wisdom¹ that are similar to the conception of wisdom that will be presented in this study. Historically there has been trend to look at how people effectively deal with life's challenges and the people who best deal with these problems have often been labeled as wise. In this study the historical tendency of adopting the notion of wisdom to describe exceptional conduct will continue by applying wisdom to the specific domain of teaching. Like many before me I believe that we can learn from studying those considered to be wise.

1. EXCEPTIONAL TEACHING AS WISDOM

In at least three studies a model for exceptional teaching, based on a conception of wisdom, has been proposed. In the first study, Clark,

¹ As did numerous other philosophers throughout the years. A good introduction to this topic is Robinson (1990).

Clark, Fidler, and Underwood (1993) highlight several aspects of wise teaching, including: reflection, teaching from the student's point of view, respecting students' struggles to make sense of the world, and generally holding a developmental perspective on teaching. The rationale for their inquiry stems from the belief that teachers, to be "wise", must take a step back from their "expertise", (i.e., not give the students all the answers but guide their learning so that they may find the answers for themselves). Clark et al.'s work is especially encouraging because these researchers are also practicing teachers.

In similar research, Yinger and Hendricks-Lee (1993) offer an "ecological conception of teaching." They stress that in order to understand exceptional teaching we must realize that the nature of knowledge can only be understood within the realm of "integrated and holistic systems"; that knowledge can only be understood within the framework of our social world. We are social beings in a social world and even the most seemingly individual of cognitive tasks are grounded in the social environment. Becoming an exceptional teacher, according to these authors requires knowing that:

1. knowledge cannot solely be viewed as a matter of mind and person but of relationship and place (p.269).
2. becoming knowledgeable (learning) chiefly involves acquiring appropriate conversational abilities and repertoires that allow one to establish and maintain a functional (intelligent) relationship with one's environment (p.270).

3. teaching creates opportunities for learners to think and act in relation to various aspects of the environment (systems) and model appropriate conversations and relationships (p.270).

Therefore, unlike traditional theories of teaching, which are premised on the belief that knowledge is the property of the individual, the concept of ecological intelligence shifts the focus from individual cognitive processing to the relationships and activities within environmental systems. Exceptional teachers recognize that each of their students, as well as themselves, comes into the classroom being influenced by various systems. The teacher's job is to connect new knowledge to the existing systems of each student.

Finally, Lee (1993) has recognized that exceptional teaching is a simultaneously intellectual, emotional, and interpersonal process. Lee, based on Scheffler (1985), suggests, in her article on "The Place of Wisdom in Teaching" that three contexts should be considered when discussing exceptional teaching: (a) *the realm of knowledge*, (b) *the realm of imagination* (imagination, creativity, and possibility) and, (c) *the realm of benevolent social processes* (an ethic of care and responsibility). Lee believes that exceptional teaching goes beyond easily codified and articulated knowledge typical of traditional teaching models (e.g., Berliner, Stein, Sabers, Brown-Clarridge, Cushing, & Pinnegar, 1989; Shulman, 1987). Lee calls for a *hermeneutic turning*, which brings to the fore teacher's *tacit knowing* and thus reveals their deeply embedded personal thoughts, beliefs, values, desires, doubts, uncertainties, and questions. Lee's rationale for

proposing her model is that she wishes to extend the boundaries of what is regarded as teacher knowledge.

The proposed model of exceptional teaching will have much in common with Scheffler and Lee's description of exceptional teaching. The present model, however, will be based on Jurgen Habermas's (1970) theory of *knowledge-constitutive interests*. The reason for selecting Habermas's theory and extending it to a model for exceptional teaching is that I believe Habermas's theory is a sound and comprehensive description of how human beings can *know*.

Like Holliday and Chandler (1986), Habermas's theory will be used as a framework for understanding how people can know. Holliday and Chandler's work will be extended, however, by applying Habermas's theory to the specific domain of teaching. Thus, Habermas's theory of knowledge-constitutive interests may provide the foundation for a conception of wisdom, and wisdom, may be the best way to describe exceptional teaching. With this in mind a discussion of Habermas's theory follows.

Habermas's theory concerns the *fundamental interests* that influence how knowledge is constituted or constructed. *Interests*, according to Habermas, are the fundamental orientations of the human species (described by Holliday and Chandler [1986; p. 20], as the "preconditions of experience"). Together Habermas's three knowledge-constitutive interests fully describe the ways that human beings *know* their world. Knowledge-constitutive interests both shape what we

consider to constitute knowledge, and determine the categories by which we organize that knowledge (Grundy, 1987). Each of Habermas's three knowledge-constitutive interests - technical, practical, and emancipatory - will be discussed in turn.

Habermas's technical interest is rooted in a fundamental interest to control our environment and describes a way of knowing that is rational, logical, and emotion-free. Technical knowing is especially evident in the philosophical position of modern empirical-analytical science. The knowledge associated with doing such science is comprised of hypothetico-deductive connections of propositions that permit the deduction of law-like hypotheses. The general question asked as a result of a technical way of knowing is: "What can I do? Not only is deduction from observations part of the technical interest, knowledge is also structured from such hypotheses to allow for prediction and control. Therefore, what counts as knowledge is guided by a fundamental interest in explaining - with explanations providing the basis for prediction, and predictions providing the basis for controlling the environment. Technical knowledge has become the most valued form of knowledge in modern western society, including within the teaching profession. An emphasis on technical knowledge to describe the best teachers has culminated in a description of exceptional teachers as "experts" (Berliner, 1986; Shulman, 1987).

For Habermas's practical knowledge-constitutive interest the question becomes "What ought I do?"² The practical interest stems from the human need to live in harmony with the environment, as opposed to the technical interest that attempts to assert control over the environment. Habermas maintains that the difference between the humanities and sciences is fundamentally a difference in knowledge-constitutive interests, not method. As a result, scholars in the humanities have traditionally pursued knowledge biased by a "practical" way of thinking, whereas scientists have pursued knowledge biased by a technical way of thinking. The essential aspect of Habermas's practical knowledge-constitutive interest is concerns *inter-subjective communication* or the effective communication of one person's thoughts, ideas and feelings. The person whose thinking is guided by a strong practical interest, therefore, would likely have a vast repertoire of effective social skills, or considerable knowledge of the social-structure of a given environment. Habermas emphasizes that understanding idiosyncratic communication across individuals is a form of knowledge unto itself. In short, the practical interest is a fundamental interest in understanding the environment (including other people) through interaction based upon consensual interpretation of meaning.

Habermas (1970) specifies a third knowledge-constitutive interest designed to prevent people from being entrapped by the exclusive

² It is a "practical" interest because there is a concern in taking "right" (practical) action.

subscription to either one of the two previous interests. The emancipatory interest prevents the individual (when it is employed) from depending on the knowledge obtained from either of the two previous interests. In a sense, it is a "meta-interest." Habermas calls it a "pure" interest because it is the only interest that comes entirely from within the individual. In other words, the emancipatory interest is concerned with freeing oneself from both the arbitrary forces of nature (technical interest) and the social structures (practical interest) that limit self-understanding, and is only possible through critical self-reflection (Holliday & Chandler, 1986).

Individuals who incorporate emancipatory knowing into their thinking are autonomous and responsible because they understand that it is their obligation to reflect on matters that concern them, which may not necessarily conform to popular opinion or science. Thus while the other two interests are concerned with control and understanding respectively the emancipatory interest concerns "empowerment": the ability of individuals and groups to take control of their own lives in autonomous and responsible ways. Emancipatory knowing is the ability to look at all the possibilities, thus rarely judging in advance, even if an outcome seems obvious. Open-minded, creative, reflective, relativistic, etc., are elements of emancipatory knowing. In short, the emancipatory interest stems from a need to engage in autonomous action arising out of authentic, critical insights into the intellectual and social constructions of human society.

As a summary, perhaps a metaphoric explanation of Habermas's theory of knowledge-constitutive interests might offer further clarification. Figures 1a, 1b, and 1c show that technical and practical interests have cognitive "weight", and that emancipatory knowledge acts to balance that weight.

Figure 1a
Graphical Representation of
Habermas's Theory of Knowledge-Constitutive
Interests

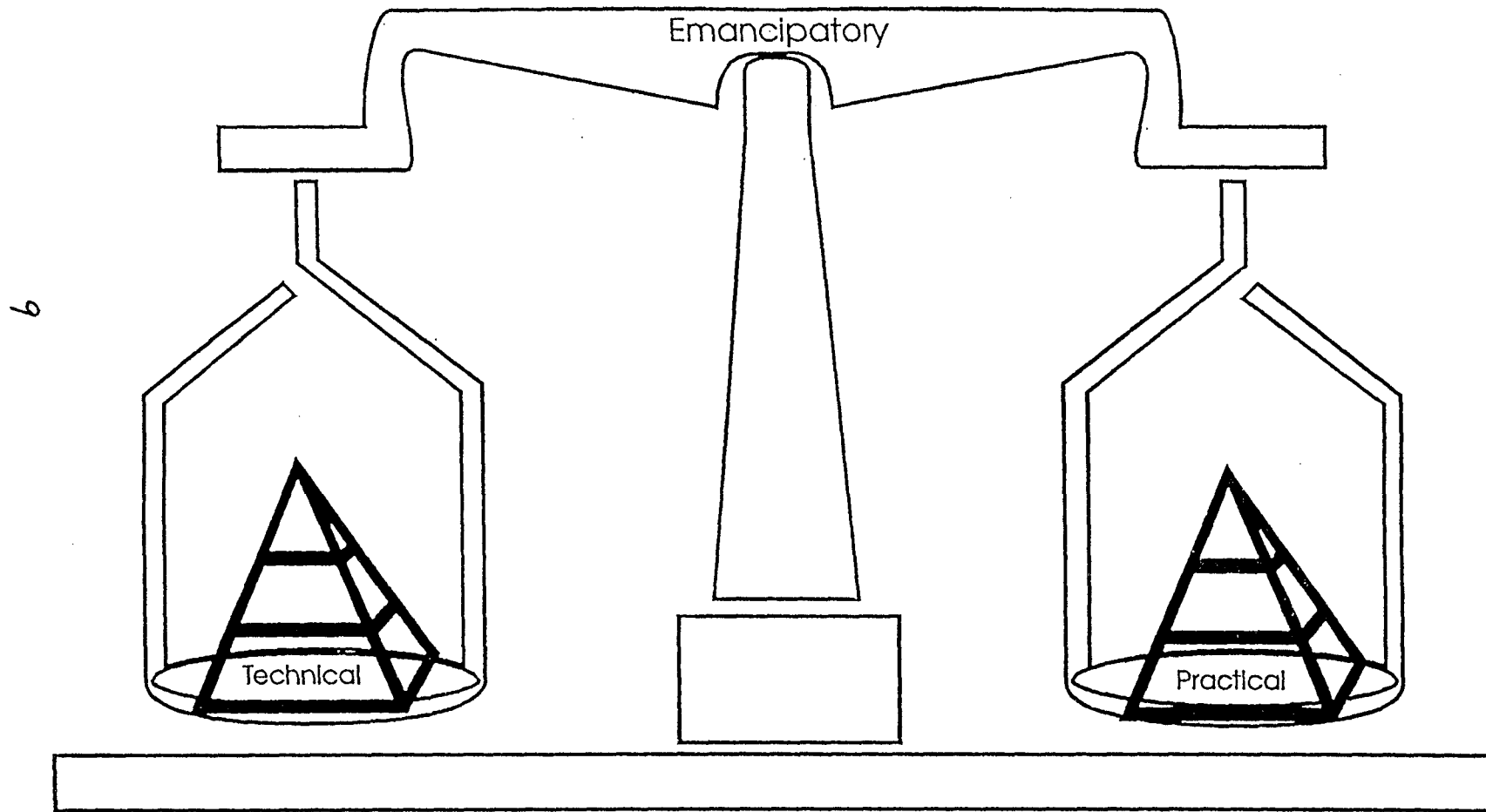


Figure 1b
Graphical Representation of
Habermas's Theory of Knowledge-Constitutive
Interests

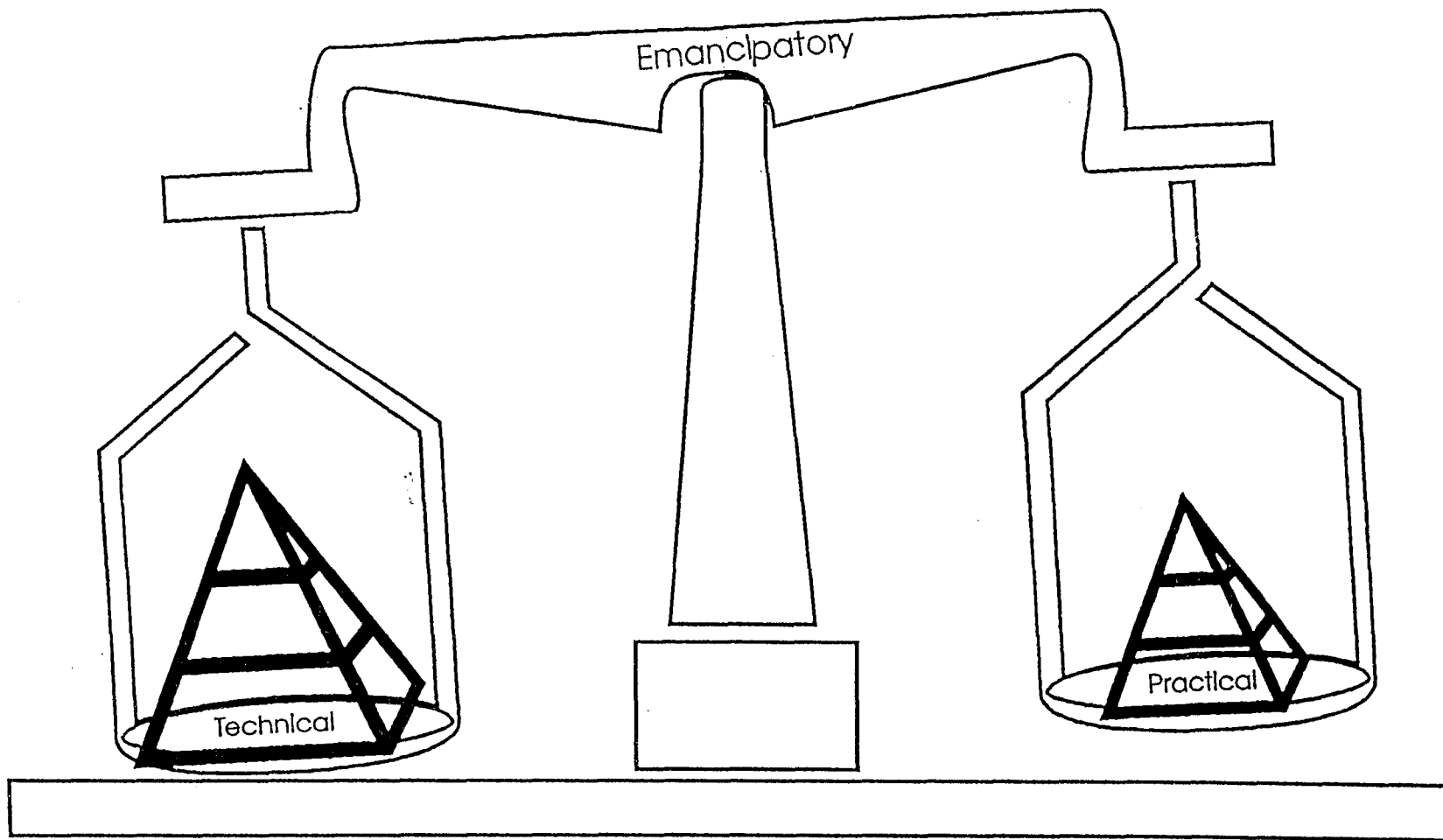
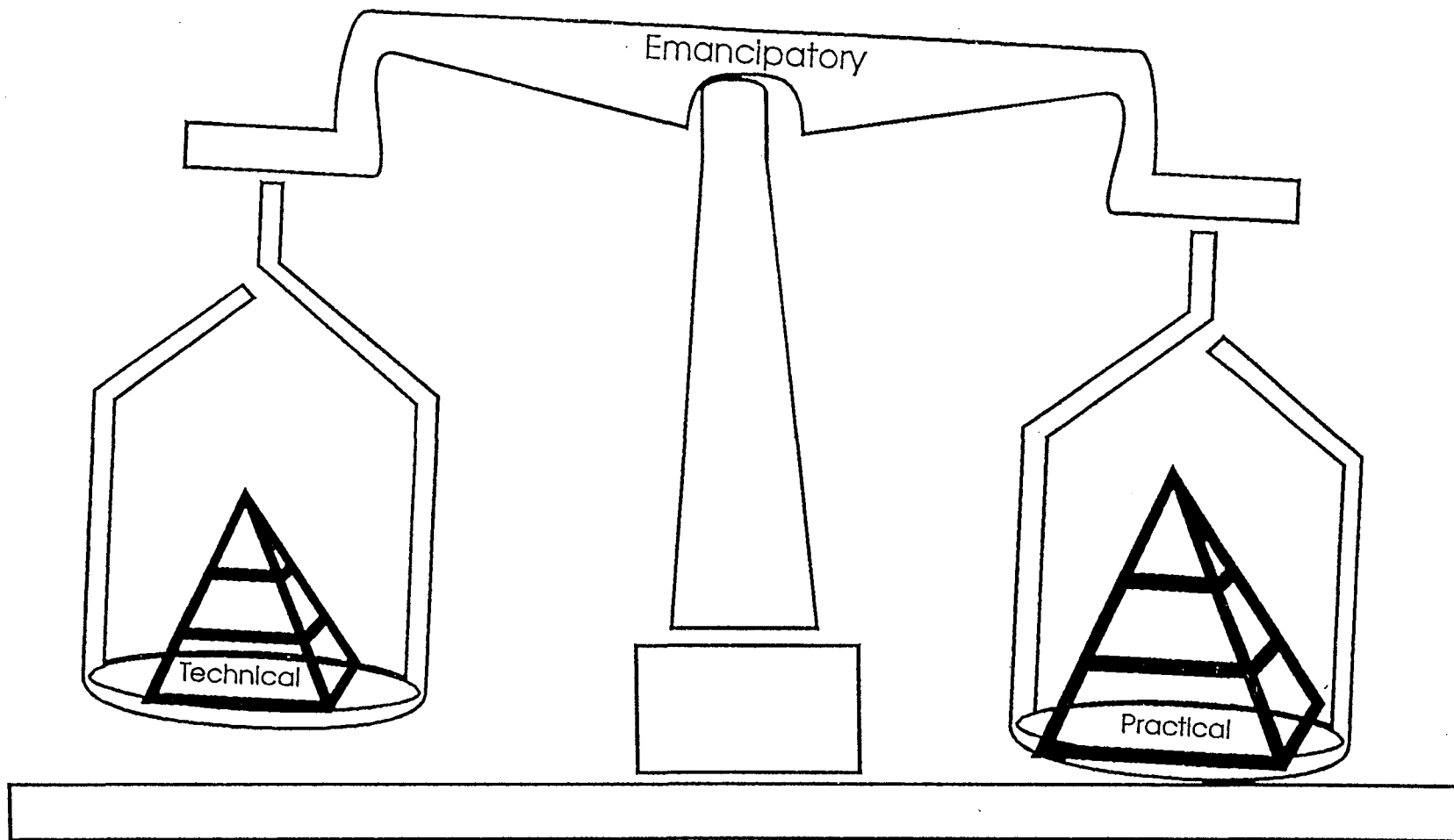


Figure 1c
Graphical Representation of
Habermas's Theory of Knowledge-Constitutive
Interests



With a scale of this type, if the weight of one side is heavier than the other side, then the scale will tip in favour of the heavier side. Therefore, if a person has more of one type of knowledge (technical or practical) the scale will tip in that direction. One can still maintain a balance, however, through the judicious use of emancipatory knowledge. Therefore, the distinguishing characteristic of the wise person, using this graphic representation, is that the "scale" that is emancipatory knowing is adjustable to compensate for tendencies to think exclusively in either technical or practical ways. Therefore, emancipatory knowledge is used to maintain a balance between technical and practical knowledge. Those closer to true wisdom might be said to more flexibly balance technical and practical knowing via emancipatory knowing.

The utility of Habermas's theory of knowledge-constitutive interests is acknowledged in other important areas of educational theory, as well. Kemmis and Car (1986) propose that Habermas's (1970) theory can be used as a model to organize future research in the growing area of *action research*. Kemmis and Car (1986) argue that the technical, practical, and emancipatory features of Habermas's theory could be useful for guiding and organizing future action research. As a guide, the theory could be useful because it clearly outlines three distinct and important knowledge areas that must be addressed. As an organizer, it may be useful because it will classify future work by teacher

researchers into three categories that they argue cover the ways in which human beings can know.

Grundy (1987) has made a similar claim in the area of curriculum theory. Grundy's claims, however, tend to emphasize the *reorganization of past research* via Habermas's theory (much like I intend to do in chapter 2). Grundy suggests that curriculum theory and practice has been biased towards technical ways of knowing, or as she puts it "product over praxis." Grundy believes that curriculum theory and practice must move toward *praxis* (or *the ways we can know*) rather than *what we can know*. In many ways then, Grundy's ideas parallel those proposed in the present research, except her research focus is the curriculum and the present research focus is on teaching.

Throughout this section a model of exceptional teaching based on Habermas's theory has been suggested. In the previous section it was suggested that wisdom may be at the heart of exceptional teaching. Perhaps a connection can be made between wisdom and Habermas's theory. Habermas's theory of knowledge-constitutive interests is a theory of how human beings can know their world. It is a comprehensive theory that seems to account for the fundamental ways that we can know. Wisdom is an equally thorough construct. Wisdom takes into account: a) intelligence and knowledge, b) social adeptness and morality, and, c) a way of thinking that *freed* people from narrow views and biased perspectives. Wisdom may be the best description of ultimate human development and Habermas's theory may be the best account of wisdom. As a result,

Habermas's theory of knowledge-constitutive interests is the operational definition of wisdom in this study.

B. THE PROBLEM

An adequate model of exceptional teaching has not yet been developed. The main purpose of this thesis is to describe exceptional teaching; specifically, the question being addressed is, "what are the underlying characteristics of an exceptional teacher?"

In the attempt to answer the question of what exceptional teaching is, other subquestions are introduced. Including:

1. Can general conceptions of wisdom be applied to a specific occupational domain such as teaching?
2. Will Habermas's theory of knowledge-constitutive interests provide a viable model of exceptional teaching?
3. What is the relationship of expertise and wisdom, within the specific domain of teaching? Expertise and wisdom have been the primary ways that exceptional teaching has been described in the literature. As a result, I would like to find out how they compare.
4. Can evidence of "wise" teaching, as defined by Habermas's criteria, be found in the everyday activities and thoughts of teachers identified as exceptional.

If the present research can shed light on the nature of exceptional teaching we might know more about the nature of teaching and perhaps refocus predominant views of the best way to teach.

C. JUSTIFICATION OF THE STUDY

There are a number of reasons why this thesis is worthwhile. First, we are all familiar with somebody we might consider "wise." Although we may be hard-pressed to describe why we believe this person is wise, we, nevertheless, have faith in his or her wisdom. The point is that even the most ardent empiricist would surely concede that there is a concept of wisdom in the minds of women and men. An attempt will be made in the present study to demonstrate that there is a conception of wisdom in the minds of men and women, and that we can measure it. Indeed, Csikszentmihalyi and Rathunde (1990) believe that wisdom has been an important adaptive mechanism for human beings, guiding thought and behaviour, and ensuring human progress for centuries. These authors state that throughout history, "wise" has reliably described the preeminent thinkers of any society, including the present one.

A second justification is that little if any research has been done on wisdom in a practical setting. Following in the informative footsteps of Arlin (1986, 1987, 1989, 1990a), and Lee (1993), wisdom in teaching will be explored.

A third reason why a study on wisdom in teaching is timely comes from Lickona's (1991) argument on the lack of character and social responsibility that is apparent in today's schools. Given the description of a wise teacher as a person with highly attuned social skills and an elevated moral standard, who better to teach for these traits (See Chapter 2). The seeming need for a rejuvenation of the

educational system is also apparent from a series of recent large-scale studies on the educational system in both Canada and the United States. The Year 2000 document produced by the British Columbia Ministry of Education, based on the Royal Commission on Education (1987), calls for a change from the traditional model of teaching. With regards to teaching specifically, the recommendations concern ways of teaching that dovetail with how wisdom in teaching will be described. Similar recommendations have been made in the United States by the Homes Group (1986) and the Carnegie Task Force (1986).

Another more practical justification of the study stems from the idea that there should be new and better ways of nominating those teachers doing an exceptional job (Berliner, 1987). Teaching is infamous for not distinguishing much between those who do their job well, and those who do not. Perhaps when a clear conception of what it means to be an exceptional teacher is understood then a feasible system for distinguishing quality teaching might be set in place.

Work on wisdom in teaching will contribute more evidence to life-span conceptions of development, as well. In British Columbia the average teacher's career does not begin until he/she is 27.2 years old.³ A series of informal discussions with practicing teachers revealed that the time required to become "competent/confident at their trade" is about 5-10 years.⁴ From such information it would seem that one may not

³ British Columbia College of Teachers.

⁴ I have been in contact with numerous teachers over the past two years and have asked them this general question.

expect optimal teaching from practitioners until they are mature adults. It would seem that meaningful cognitive growth is occurring in these individuals throughout their adult years.

Much of the recent interest in later life development is a product of our changing culture. Longer life expectancies, the advent of healthier lifestyles, better medical practices and facilities, etc., have tended to increase the life span, creating a much larger proportion of older persons in the population. With a growing and thriving population of older individuals there is an increasing need for research on these individuals (Baltes et al., 1990), and consequently, there is a need to reformulate traditional cognitive theory pertaining to adult cognition (Sinnott, 1989; Ventis, 1989). In our youth-oriented culture, the suggestion of superior performance at an older age runs contrary to typical thinking. Traditionally, literature in education and psychology has emphasized that peak performances are the jurisdiction of the young, (e.g., Inhelder & Piaget, 1958; Cattell, 1970; Horn, 1971). Baltes (1984), Riegel (1976), Pascual-Leone (1983) and Arlin (1975), however, have inspired recent research on the positive aspects of aging. Their work signifies the increasing attention that is being accorded to outstanding achievements by older individuals.

Wisdom, specifically, has been singled out as a mature form of advanced knowledge with great potential (Baltes et al., 1990; Clayton & Birren, 1978; Holliday & Chandler, 1986). To paraphrase Baltes and Smith (1990, p. 88), wisdom represents something akin to a developmental goal

that gives directionality to cognitive and personality functioning during adulthood. Concepts like intelligence have been increasingly found to be a less than comprehensive illustrations of human competence (Holliday & Chandler, 1986).

II. REVIEW OF THE LITERATURE

A. STRUCTURE OF THE REVIEW: RESEARCH ON THREE WAYS OF KNOWING

Habermas's theory of knowledge-constitutive interests will be used as an organizing framework for understanding exceptional teaching. By using Habermas's theory as an organizing framework, a wide assortment of previous research on exceptional teaching will be shown to fit into one theoretical perspective. By recasting past research on exceptional teaching into Habermas's theory of knowledge, (content) validation of Habermas's theory (as a viable description of exceptional teaching), may also be obtained. That is, can past research that pertains to exceptional teaching "fit" into Habermas's theory? If it can, then there is evidence that Habermas's theory of knowledge is a valid way of organizing the way teachers can know their professional world, and ultimately a valid way of distinguishing between exceptional and non-exceptional teachers.

Another organizing tool employed in the literature review is the arrangement of each major section on technical, practical, and emancipatory knowledge into "general or information processing research" and "developmental research." Organization in this manner will enhance and clarify discussions of major points. For example, throughout the literature review I make the distinction between *expertise* and *wisdom* as the concepts that have been used most often to describe exceptional teaching. Expertise primarily comes from the teacher cognition

literature and is based on the information processing model, whereas, a notion of wisdom in teaching generally comes from developmental research and often is the product of the constructivist model.

Before a detailed review of some present conceptions of exceptional teaching is undertaken, however, a brief historical review of wisdom will situate the current study.

B. A HISTORICAL PERSPECTIVE ON WISDOM

A notion of wisdom has been part of the discourse of humanity since at least the early Greeks (Robinson, 1990). Issues of character, self-control, subordinating passion to the authority of reason, in addition to a certain degree of intellect, all seem to be keystones of the Hellenic version of wisdom (Robinson, 1990). The study of wisdom remained an important pursuit throughout the Middle Ages, however, the focus changed from Hellenic notions to the recognition of God and His words (The Bible) as the ultimate source of wisdom. During the Renaissance philosophers (e.g., Descartes) integrated notions from antiquity with the pious ideas of the Middle Ages. They produced hybrid philosophies stressing that wisdom was attained when an individual truly believed in the word of God. Such individuals were said to have accessed a higher (transcendental) plane, as a result, putting them closer to the wisdom of God. Wisdom has played a major role in how knowledge has been conceived. As Chandler and Holiday (1990, p. 123) point out, until the 20th century philosophy's "primary task" was to elaborate the many

possible forms of knowledge, and the study of wisdom was its "characteristic endeavor."

The question remains then, what has social science done with long-held views of wisdom? The story is complex but the demise of wisdom as a topic of intellectual inquiry in the 20th century seems to be the result of other rudimentary changes in the western world.¹ With the advent of the industrial revolution, and the resulting rapid growth in science and technology there was a new-found power to control the environment. The new-found power to control the environment, combined with a historical tendency in philosophy to emphasize the theoretical aspects of wisdom to the exclusion of the practical aspects, made wisdom an uninviting topic with the advent of scientism. The meteoric growth of behaviourism in the early 20th century also meant that the way things could be known was changing. The ways people could *know* became increasingly restricted: knowing depended on what people could observe directly. There was little room for tacit concepts, like wisdom. We shall see in the remainder of the review, that wisdom as a viable concept for empirical study has made a comeback. The present work will try to add to these recent conceptions of wisdom.

¹ The reader should note that in this limited historical perspective on wisdom the many important contributions from non-Western society are not dealt with in any way.

1. EVIDENCE FOR TECHNICAL WAYS OF KNOWING

Research from two areas will be presented in this section. The first will be *general research*, which includes both information processing and teacher-cognition research. The second will be research that comes from the developmental literature. The general and developmental research presented in this section, however, share a common theme. Exceptional performance is interpreted to be primarily the result of technical knowledge. The implications of this way of viewing exceptional performance (especially in teaching) will be discussed throughout this section on technical knowledge.

I. EXCEPTIONAL TEACHING AS EXPERTISE: AN INFORMATION
PROCESSING VIEW

A substantial literature based on the information processing model has developed regarding indicators of superior performance. Studies in chess, physics, and medicine have all indicated that the most accomplished performances will be exhibited by an "expert." Glaser and Chi (1988) highlight the development of the conception of expertise and its basis in the artificial intelligence movement. Based on the computer metaphor, expertise infers that the possessor is capable of powerful search techniques based on "well-developed schemata." For example, de Groot (1965), showed in his now classic study, that what separated the master from the beginner chess player was a massive repertoire of

patterned responses to almost any configuration that could take place in a game.²

Based on the information processing model, Gagne (1977), and Anderson (1982), have established general theories of cognitive growth. Their theories describe how knowledge progresses from declarative facts (knowing what) to procedural routines (knowing how), eventually leading to incredible ease and fluidity of performance (expertise). Accordingly, when faced with problem situations in the classroom, teachers with greater experience, and thus a greater amount of "proceduralized", or as Anderson prefers "compiled knowledge", will have a greater store of information to access and will be better able to apply that knowledge quickly and accurately. Together, studies of expertise indicate that experts can be differentiated from novices on both quantitative (i.e., sheer amount of knowledge) and qualitative (i.e., flexible use and organization of knowledge) levels. Qualitative aspects are especially indicative of expert-like performances.

Indeed, a number of researchers argue that the notion of expertise based on the information processing model can be used to explain exceptional teaching. Borko and Livingston (1989), for example, found that shortcomings in novices' as compared to experts' mathematics instruction, were due to less elaborate, interconnected, and accessible

² Cobb, Yackel, and Wood (1988), in a common criticism of the computer metaphor, inform us that the computer metaphor employed by cognitive theorists is inappropriate if we are to take into account experience. They ask, how can computers accurately reflect human ways of knowing if they do not experience as humans do?

cognitive structures. Leinhardt and Smith (1985), found that when comparing novice and expert mathematics instructors the "semantic nets" that the experts had compiled to teach a difficult topic (fractions), were much more elaborate than their novice counterparts. Swanson, O'Conner, and Cooney, (1990), showed that experienced teachers approached classroom discipline problems in a more effective manner because of their ability to employ elaborate cognitive structures. Relatedly, the way problems are *represented and solved* has been shown to lead to the more effective problem solving of experts versus non-experts (Carter et al., 1988; Housner & Griffey, 1985; Leinhardt & Greeno, 1986). In these studies, and many like them, understanding what it means to be the best possible teacher is understanding the elaborate cognitive structures these teachers had acquired.

Perhaps the most articulated program of research on expertise in teaching has been assembled by Berliner and his associates (Berliner, 1986; Berliner, 1987; Berliner, 1988; Berliner et al., 1989). Berliner et al., (1989, p.67) note that experts from diverse domains, including teaching, share common characteristics, including: (a) a superior ability to make inferences about the events and objects in their purview; (b) the ability to classify problems by more than their surface characteristics; (c) faster and more accurate pattern recognition; (d) better problem representation abilities; and, (e) stronger metacognitive skills. Berliner and his colleagues interpret these findings in a cognitive psychological framework of expertise, suggesting that the

experts have a more elaborate schemata (network of knowledge for understanding practice), and repertoire of scripts (knowledge that guides routinized everyday experiences). As a result, they (Berliner et al., 1989) conclude "that experience as a classroom teacher leads to changes in cognition (i.e., in perception, memory, and thought) that seem more sophisticated, more efficient and more useful" (p.76).

Accordingly, Berliner (1988), has proposed a five-stage model of the development of expertise in teaching. These stages are:

1. *Novice*: a context-free set of rules is acquired to assist the teacher in labeling and learning classroom tasks.
2. *Advanced Beginner*: episodic knowledge is acquired and similarities across contexts are recognized. The teacher develops a strategic knowledge, an understanding of when to ignore or break rules. The teacher's prior classroom experiences and the contexts of problems begin to guide his or her behaviour.
3. *Competent*: the teacher is now able to make conscious choices about his or her actions, set priorities, and make plans. From prior experience the teacher knows what is and what is not important. In addition, the teacher knows the nature of timing and targeting errors. Performance, however, is not yet fluid or flexible.
4. *Proficient*: intuition and knowledge begin to guide performance and a holistic recognition of similarities among contexts is acquired. The teacher can now "pick-up" information from the classroom without conscious effort and can predict events with some precision.
5. *Expert*: teaching performance is fluid and seemingly effortless, as the teacher no longer chooses the focus of his or her attention. *At this stage teachers operate on automatic pilot; standardized, automated routines to handle instruction and management are in place* (my emphasis). When asked to explain or reflect on his or her performance, an expert teacher is likely to have difficulty "unpacking" and describing his or her cognition.

The five-stage model represents the professional development of teaching in a cognitive way. Progress through the five stages is primarily dependent upon teachers increasing their semantic connections, thereby increasing the speed with which routines and strategies can be employed in classroom situations. The expert teacher develops effortless cognitive strategies for most of the everyday routines like homework check and review, seat-work, and preparing a lesson. Berliner et al., (1989) propose that these routines and strategies are associated with one of two domains of knowledge - either "subject matter knowledge" or, "pedagogical knowledge" (knowledge of classroom organization and management).

Like Berliner, Shulman (1986a, 1986b, 1987) has also constructed a theory of exceptional teaching based primarily on the cognitive psychological framework of expertise. An exceptional teacher, for Shulman, is a teacher who has substantial knowledge of: (a) subject matter content; (b) pedagogical content; and, (c) curricular content. *Subject matter content* knowledge includes knowledge about facts and information pertinent to a subject area, the way concepts and principals are organized within a subject area, and the rules and objective standards for evaluating the validity of this knowledge. *Pedagogical content knowledge* is the connection of what is known about a subject area with what is known about students. The exceptional teacher effectively matches subject matter content with individual students and classrooms. *Curricular knowledge* is represented in a teacher's knowledge

of equipment, teaching methods, texts, outlines, worksheets, questions, objectives, and goals. Although Shulman refers to the "wisdom of practice" throughout his research, his description of the exceptional teacher is ultimately as expertise. Like Berliner, the effective utilization of technical skills and strategies are the most important attributes of the exceptional teacher.

Berliner's and Shulman's work typifies cognitive science research that has used "expertise" as a model for explaining how the best perform in a wide variety of domains. Perhaps part of the problem is that the notion of expertise, when it was first being considered by pioneers in the area of cognition (de Groot, 1965; Simon & Simon, 1978; Chi, Feltovich and Glaser, 1981) was appropriate for well-structured domains such as physics, chess, or remembering a sequence of random numbers. Since that time, however, researchers have increasingly tried to apply the notion of expertise across other domains, including those that are ill-structured (see Wood, 1983).

II. QUESTIONING THE EXPERTISE METAPHOR: INFORMATION

PROCESSING LITERATURE REVISITED

In an ill-structured domain, like teaching, it is difficult to apply ready-made strategies that will work all the time. Every teacher is different, every classroom is different, and every teacher is faced with frequent unanticipated problems (Voss & Post, 1988). Indeed, researchers such as, Levitt (1988) and Lee (1989) argue that the

classroom is characterized by its ill-structured nature. The problem space is broad and in flux, parameters are often unknown, and the teacher must always solve problems taking context into account. Very rarely do the problems that arise in teaching come with one particular solution; and very rarely do the problems that teachers solve daily depend solely on *technical* knowledge. The "everyday problem solving" that Lee argues exceptional teachers do, also involves caring, subjectivity, an awareness of limits and possibilities, and the process of asking questions as well as answering questions. Lee comes to the conclusion that an adult model of reasoning must take the *everyday* complexities of problem solving in ill-structured domains into account.

Some researchers are indeed beginning to recognize the "complexities" of the ill-structured classroom. As Berliner et al., (1989; p. 68), point-out, problem-solving in a "public, complex, and dynamic environment is among the most difficult of professional jobs" and as a result, classroom teaching seems to be much more "complicated" than traditional domains in which expertise has been studied. Berliner et al., (1989; p. 92), concede that the present conception of the "expert" teacher is probably "inadequate", however, it is a "temporarily useful way of thinking" (See also Sinnott, 1989).

In a similar argument to Berliner et al., Wilson, Shulman, and Richert (1987) argue that the components of the "professional knowledge base of teachers" should include knowledge of: *subject matter, pedagogical content, other content, curriculum, learners, educational*

aims, and general pedagogy. From a description of the knowledge base of teachers these authors developed a model of professional growth that proceeds from: *comprehension*, to *transformation*, to *instruction*, to *evaluation*, to *reflection*, and finally to *new comprehension*. The final two stages of "reflection" and "new comprehension" are indicative of thinking not usually accorded to experts.

In the area of teacher planning Clark and Yinger (1987), find results that are comparable to the results of the previous study. They emphasize that skills called for in the socially dynamic classroom are not done justice by:

the systematic application of predetermined models or standardized techniques. These situations call from the practitioner the artful use of skills such as problem discovery and formulation, design, invention, and flexible adaptation. The orderly prescriptions of science and technology do not seem to match what professionals do in practice (p. 97).

As in the previous studies, terms and phrases such as "artful use of skills", "invention", and "flexible adaptation" convey that skills based on creativity, open-mindedness, and imagination are important, but in this case they are important for dealing with the "socially dynamic classroom."

Carter, Sabers, Cushing, Pinnegar, and Berliner (1987), provide more evidence that the concept of "expertise" may not fully describe exceptional teaching. In this particular study "expert" teachers were more reluctant than novices or postulants to make pre-judgments

concerning a class they were about to teach. Responses such as the following were typical:

I just don't think names are important as far as this point in time. I haven't met the kids; there is no reason for me to make any value judgments about them at this time. And so she [the previous teacher] had a whole little packet of confidential material that I looked at, and it had trivial little things about where the parents worked and this kid was cute or something like that, and that to me is not relevant (p.154).

Such responses were interpreted as the expert teacher's ability to "merge information" into a group picture. While this is basically true, it does not seem to fairly account for what the "experts" are doing. They are using more than cognitive ability to *merge information*; they are utilizing various abilities more closely related to what might be called wisdom to determine that basing their teaching of a class on somebody else's evaluation is misleading and inappropriate. In short, their experience tells them that it is probably wise to defer judgment on any class until they have had the opportunity to interact with them personally.

Carter (1986), in describing the difference between a teacher who successfully managed her classroom and one who did not, describes the successful teacher as a "driver navigating a complex and often treacherous route" (p. 150), whereas, the unsuccessful teacher, relies on reprimanding individual actions regardless of their nature. The unsuccessful teacher's actions promote ill-feelings and disrupt the flow of the classroom. What is most important in the present context,

however, is that differences between these two teachers are interpreted as differences in the cognitive "knowledge structures." The metaphor comparing the successful teacher to a "driver navigating a treacherous route" seems to imply skills like imagination, risk taking, and social astuteness; skills that seem to go beyond the purely cognitive.

A "micro-teaching" study by Berliner et al. (1989), produced a similar finding. The participants, after being given 30 minutes for preparation, were asked to teach a "difficult" lesson on Pasqual's Triangle to 15 students they had never seen before. The students as confederates of the experimenters, performed a number of actions designed to interrupt the flow of the lesson. The results indicated that the expert teachers, much more so than novice or postulant teachers,³ were very uncomfortable with this situation. Two details made this so: (a) the difficulty of the lesson (Experts said things like, they would *never teach such a difficult lesson with only 30 minutes preparation.*); (b) although there was basic order in these classrooms, the experts felt uncomfortable because they knew they were not in complete control. Berliner et al. (1989), state that the combination of these two variables "undermined [the expert's] confidence...and ability to perform" (p. 88). As Berliner et al. (1989), point out... "these experts are very proud people; their teaching is usually successful; they did

³ Experts were nominated by administrators and had a number of years experience; novices were student-teachers with some teaching experience and some theory, etc.; postulants were acknowledged professionals in a given subject area, who often came from other lines of employment, but had no teaching experience whatsoever.

not like the situation we had created for them" (p. 88). Generally, the novices and the postulants (more so the postulants) did not seem to be concerned about quality of their teaching; it seems they were overwhelmed with the task at hand.

In summary, thinking about exceptional teaching solely as "expertise" results in the tendency to neglect other important aspects of exceptional teaching. Welker (1991) cautions researchers to be wary of the "teacher as expert" metaphor by using theoretical and historical evidence to claim that the characterization of "teacher as expert" has served the purpose of hierarchically organizing the profession. The tendency has become to turn to so-called "experts" for the "right" way to do things when most people would agree that the ill-structured domain of teaching must be open to many right ways of doing things. Welker uses examples from technically-oriented teacher education programs (that tend to promote the "right" way to teach), to the increasing number of "specialists" in education, (who's expertise must be referred to for an increasing number of problems). Welker's critique concludes with the warning that viewing exceptional teaching as "expertise" will diminish the social and moral responsibilities of teachers, and turn students and the wider public into passive receivers of expert service.

Possibly part of the explanation why recent researchers have been comfortable with explaining exceptional teaching as "expertise", is what Ernst (1992), has called the *epistemology of action*. According to Ernst, teaching, like most other professions, is embedded within the context of

a culture that has emphasized objectivism. Most beginning teachers, despite what they feel good teaching should be, end up being behaviourists in the classroom (Tobin, Tippins, & Hook, 1992). Management and control of the classroom become their number one priority. "Expertise" is the culmination of epistemology in action, whereas truly exceptional teaching is more. Therefore, one can only partly explain exceptional teaching by stating that teachers follow prescribed strategies. Expertise connotes that there is a definable and agreed upon body of knowledge that can be mastered. Part of becoming a wise teacher, on the other hand, requires that the teacher realize and accept that there is no definable body of knowledge that they can truly master. The danger seems to be that once one believes that they can know all there is to know about a subject complacency sets in. Part of becoming an exceptional teacher, therefore, stems from a realization that no matter how knowledgeable one becomes about a subject area, they still must remain open to new learning experiences.

In summary, thinking about exceptional teaching solely as "expertise" results in the tendency to neglect other important aspects of exceptional teaching. This comparison between wisdom and expertise leads to a more general statement concerning the relationship between wisdom and expertise. Expertise may be best thought of as a necessary yet insufficient condition for attaining wisdom. Expertise, therefore, is one facet of the more general concept of wisdom. This idea will be reemphasized throughout the thesis.

III. EXCEPTIONAL TEACHING AS EXPERTISE: A DEVELOPMENTAL VIEW

Like the previous subsections, exceptional teaching in this section, will be described as an end product of technical knowing. The evidence in this section, however, will be based on a review of the cognitive developmental literature, as opposed to the information processing literature. As was the case at end of the previous section, the adequacy of viewing exceptional teaching as primarily resulting from technical knowledge will be assessed.

Formal operations, Inhelder and Piaget (1958) conclude, are the pinnacle of human thought; the formal operational thinker can form hypotheses, make inferences, generalize from their experience, and transfer their knowledge across analogous situations. Called the *hypothetico-deductive* method or approach by Inhelder and Piaget (1958), the focus on formal operations has resulted in conspicuous limitations of Piaget's developmental theory, especially in terms of explaining cognitive development in mature adults. Piaget's stress on problem-solving based on logical-deductive thinking as a way of describing how adults know their world is seen to be too narrow to describe the increasing complexities of adult thinking (e.g., Arlin, 1975; Broughton, 1984; Byrnes, 1988).

Broughton (1984; pp. 403-408), perhaps more vehemently than most critics of Piaget's theory, argues that formal logic should not be considered as the end-state of human development. Broughton cites 15 "major problems" with the formal-operational model, and although he may

go further in his criticism of Piaget's theory than most developmentalists would, his general point is useful in the present context. Broughton suggests that Piaget's theory is too narrow in scope to be ecologically valid. In essence, a developmental theory that focuses on the preeminence of scientific logic cannot account for all facets of development. Although traditional Piagetians, do not deny that there are ways of knowing beyond the *hypothetical-deductive* method, their research efforts have focused on this one way of knowing. By emphasizing formal-operational thinking based on the *hypothetico-deductive* method, less consideration has been given to the social, biographical, historical, and philosophical influences on how human beings can come to know something. Much of what is being defined as exceptional teaching in the present study, therefore, is neglected by a developmental theory in which formal operations is portrayed as the peak of adult development.

The Dual Component Model

Baltes (e.g., Baltes, Dittman-Kohli, and Dixon, 1984; Baltes and Smith, 1984; Baltes and Smith, 1990) and his colleagues have perhaps done more than other researchers for the rebirth of wisdom as a viable concept for study in the social sciences. A brief review of Baltes et al.'s framework of wisdom, however, will ultimately demonstrate that their definition of wisdom is primarily a conception of expertise based on the information processing model, and therefore inadequate as a full

explanation of wisdom in general, and exceptional teaching in particular.

Baltes, Dittmann-Kohli, and Dixon, (1984, p.70), "conceive wisdom as an expert knowledge system...[or more specifically] a highly developed body of factual and procedural knowledge leading to good judgment concerning the fundamental pragmatics of life." In essence, the wise person is an expert in the fundamental pragmatics of life. Called the "dual-component model of life-span cognitive development", Baltes and his associates have essentially developed an elaborate conception of *intelligence* based on the information processing model. They have juxtaposed the "mechanics" (nature) and "pragmatics" (nurture) of intelligence. The *mechanics of information processing* are content free, universal and biological, and susceptible to genetic differences. The *knowledge-rich pragmatics* deal with "expertise in the fundamental pragmatics of life:" life planning, management, and review, and are based on cultural experience. According to Baltes and Smith (1990; p.95), "the differentiation of the mind into mechanics and pragmatics helps us understand why there are aging losses and aging gains" in all people's cognitive ability. The genetically driven "mechanics" are said to be associated with losses to intelligence with age, while the culturally driven "pragmatics" are said to be associated with gains to intelligence with age. Therefore, wisdom for Baltes can be seen as an age-related form of adaptive intelligence; it is an extension or adjunct to psychometric intelligence (Cattell, 1971; Horn, 1970).

The "fundamental pragmatics of life" that essentially define wisdom for Baltes, are measured by five criteria:

1. *Rich factual knowledge about matters of life:*

The wise person has "a rich data-base of life-matters" (Baltes & Smith, 1990), which include general knowledge about the nature of typical events and decisions, the vulnerability, emotions, and needs of individuals (e.g., attachment, sense of self, health), and the controllability of developmental goals across the life span (Heckhausen & Baltes, 1988, p.100).

2. *Rich procedural knowledge about life problems:*

The person has a large repertoire of mental procedures (or heuristics) used to select, order, and manipulate the information in their purview and use it for purposes of decision making and action planning.

3. *Knowledge of the contexts of life and their relationships:*

The individual has a firm understanding that life development and life events are embedded in multiple life span contexts (age-related, sociohistorical, idiosyncratic), involving thematic (family, education, work, leisure, etc.), temporal relationships, and conflict and tension as well.

4. *Relativism:*

The person has vast knowledge about differences in individual and cultural goals, values, and priorities. They value flexibility when interpreting life histories and life situations of others. They are aware that all judgments are a function of, and are relative to, a given cultural and personal value system.

5. *Uncertainty:*

The wise person recognizes the unpredictability and indeterminacy of life. Therefore, they are good at asking questions (Meacham, 1983) or "problem finding" (Arlin, 1990).

Persons who are wise, are said to be so because their responses to Baltes's "life-planning and life-review tasks" satisfy the summative criteria of showing rich *factual* and *procedural* knowledge by approaching these *uncertain* tasks in ways that are *contextualized* and *relativized*

(Baltes & Smith, 1990). The criteria of *uncertainty*, *contextualism*, and *relativism* are especially interesting because they may parallel Piagetian formal operations; moreover, some researchers (e.g., Arlin, 1984, 1986, 1990) argue that these criteria, especially relativism, may be indicators of mature adult thought.

Baltes's five criteria that describe a conception of wisdom in general, share some similarities with the proposed conception of wisdom in teaching, based on Habermas's theory. First, rich *factual* and *procedural* knowledge are related to Habermas's technical knowledge-constitutive interest because both are concerned with a way of knowing that emphasizes the accumulation of facts, procedures, strategies, etc., and both are dependent on a systematic or logical reasoning. Second, *uncertainty* and *relativism* both seem to be related to Habermas's emancipatory way of knowing because they are concerned with "freeing oneself" from both the arbitrary forces of nature and the social structures that limit self-understanding. The individual realizes that any knowledge is ultimately uncertain and relative. Third, Habermas's practical interest is comparable to Baltes criterion of *contextualism* because both concern the effective communication of one person's thoughts, ideas, feelings, etc., leading to the growth of a vast repertoire of effective social skills, or considerable knowledge of the social structure of a given environment.

The parsimony of Habermas's knowledge-constitutive interests (three criteria versus five) is one reason why it was selected as the

model of exceptional teaching in this study over Baltes's framework. The other more important reason, however, pertains to the theoretical frameworks from which Baltes and Habermas derived their theories of knowledge. As noted, wisdom for Baltes's group is an age-related form of adaptive intelligence; an extension or adjunct to psychometric intelligence. Thus Baltes's theory of wisdom remains true to its intellectual forefathers (Cattell [1971], and Horn's [1970]) theory of fluid and crystallized intelligence). By embracing this theoretical framework the Berlin group have approached their findings from a perspective that ultimately emphasizes technical ways of knowing. Baltes and Smith, (1990; p. 95) for example, state that their five criteria of wisdom emphasize the importance of viewing wisdom as an "expert knowledge system concerning the fundamental pragmatics of life." They further state that "at present, our focus is to study wisdom as a *body of knowledge*" (my emphasis), (Baltes & Smith, 1990; p.96). Wisdom for the Baltes group is something that human beings can know - like we know how to fix a leaky faucet. If we just spend enough time tackling difficult life issues we can learn to be wise. For Baltes wisdom seems to be a matter of the accumulation of facts and procedures, even for the *uncertainty, relativism, and contextualism* criteria; the wise person is the person who has accumulated a substantial storehouse of knowledge regarding the uncertainty, relativism, and contextualism of life.

For Habermas, who's knowledge-constitutive interests provide the framework of wisdom in the present study, knowledge is a qualitative way

of knowing, not just a quantitative accumulation of the things we can know. Other aspects of being human, besides intelligence, are essential for the development of wisdom. Wisdom is a matter of character, will, conscience, virtue, as well.

A discussion of the method that Baltes used to assess wisdom will extend this argument. Participants in Baltes's standard data collection procedure respond to *life-planning scenarios*. Life-planning scenarios are brief descriptions of typical, yet difficult, life dilemmas that participants are asked to talk freely about (as if they are giving advice to their best friend). Some representative scenarios include: *a woman deciding whether to have children or accept a major promotion; or, a teenage girl deciding whether or not to have an unplanned baby*. Participants, after they are presented a scenario and told to develop a life plan for this person that cover the next three to five years. Participants are encouraged to "think aloud" throughout the life planning task. Their responses are tape recorded and transcribed for assessment. Dilemmas are assessed according to their compliance with Baltes's five criteria of wisdom. Five sets (one for each criterion) of independent assessors rate the dilemma. For example, two independent assessors may rate the "contextualism" criteria. The ratings from all independent assessors are combined and consistently high ratings across the five criteria are assumed to illustrate "wisdom."

The decontextualized nature of the task, however, leads to a problem with Baltes's methodology: it promotes the influence of

technical knowledge in solving the life dilemmas. Therefore, even though Baltes states that relativism, uncertainty, and contextualism are part of a description of wisdom it is difficult to understand how they can manifest themselves in these decontextualized scenarios. The assumption Baltes makes is that participants will respond the same way as they would if they were faced with these dilemmas in real life. Participants given this particular task do not have to deal with the actual emotions that come with these dilemmas in real life. As Kekes (1983), points out, it is important to verify that what is measured in theory is actually occurring in practice. The "Polonius-Syndrome" concerns the idea that "any fool can learn to say all the wise things a wise man says and to say them on the same occasion" Kekes 1983, p. 286. The point is that there is reason to question that the people who are rated as "wise" according to the Baltes's criteria, will be the people who display wise behaviour in everyday life, and vice-versa. In the pursuit of scientific rigor, there is a disregard in Baltes's methodology for important aspects of wisdom that can only be noted in the context of real events and happenings.

Baltes's tasks may also lack reliability and validity, in another way. Participants who respond to the Baltes's tasks may have had experience with these particular dilemmas, thus, calling into question whether these tasks are measuring anything but established strategies. The commonplace nature of the dilemmas almost ensures that everyone who completes this task has dealt with them either directly or indirectly in

their lives. Therefore, a legitimate question is whether participants are just tapping cognitive strategies that they have heard work with particular dilemmas? The decontextualized nature of Baltes's task and the commonplace nature of these tasks may lead to the same general conclusion. The Baltes approach to assessing wisdom may actually assess knowledge of a more technical nature rather than the true essence of wisdom (see Clayton & Birren, 1980; Cohen, 1958; Marcel, 1951; Habermas, 1970; Holliday & Chandler, 1986; Labouvie-Vief, 1990).

Methodologies used in other studies (Berliner et al., 1990; Sternberg, 1990; Holiday & Chandler, 1986), however, may be more appropriate to assess wisdom. Berliner and his colleagues, by choosing their "expert" teachers through the nomination process (usually by an administrative official), have provided some ecological validation for the assumption that "expert" responses to their tasks reflect "experts" in real life. Sternberg (1990), and Holiday and Chandler (1986), have used the "implicit theories approach" that directly asks respondents how they would describe, wise, creative, or intelligent people. In so doing, a definition of wisdom is ascertained that is not limited by methodology. Indeed, one of Chandler and Holliday's (1990), main concerns with Baltes's work is that it deviates unacceptably from a common (everyday) conception of wisdom.

Baltes and his group push at the gates that lock in unitary conceptions of knowledge, yet they still emphasize technical knowledge and its pragmatic resolution, thus, ultimately adding to psychometric

conceptions of intelligence. Wisdom is equated with expertise, the good life is confused with the prudent life, and their research methods do not allow them to discern the wise from the unwise. Key concepts for Baltes are still "expertise" and "specialization."

IV. SUMMARY

In both teacher cognition (e.g., Berliner, 1986; Shulman, 1987) and developmental research (e.g., Baltes's et al., 1984), exceptional teaching seems to be closely associated with Habermas's technical way of knowing. Although technical knowing is important for the development of exceptional teaching, it is only one facet of the exceptional teacher. Indeed, the different characteristics of "technical" knowledge (i.e., intelligence, strategies, skills, etc.), are certainly necessary to become an exceptional teacher, however, they are not sufficient. The researchers whose studies were reviewed in this section tended to overemphasize the role of technical knowledge for exceptional teaching; or, did not acknowledge that other ways of knowing were also necessary for exceptional teaching.

The role of non-technical knowing will be acknowledged, however, in the next two sections. The main objective of the next two sections will be to assess the extent that exceptional teaching is related to Habermas's notions of practical and emancipatory knowledge-constitutive interests.

2. EVIDENCE FOR PRACTICAL WAYS OF KNOWING

In order to live, work, and learn in the classroom, children need to develop those responses that result in positive social interaction. While children will not necessarily be consistent in their behaviour, they will be learning to be social and will be developing behaviour for appropriate social interaction (Year 2000; p.27).

When students feel that they are valued members of the school community, the school becomes more effective at fostering all aspects of their development - intellectual, social, and moral (Schnaps & Solomon, 1990). The benefits, therefore, of creating a caring community with the teacher at the center cannot be overlooked, as the excerpt from the Year 2000 document indicates.

As in the previous section, Habermas's theory of knowledge-constitutive interests will provide a framework for research relevant to exceptional teaching. The emphasis in this section, however, is on Habermas's practical way of knowing. Habermas's practical knowledge-constitutive interest is primarily concerned with *inter-subjective communication* or the effective communication of one person's thoughts, ideas, feelings, etc., to others (see chapter 1). The argument is that the wise person has a vast repertoire of effective social skills, and possesses considerable knowledge regarding the social-structure of a given environment. Therefore, practical knowledge is equated with social knowledge or skills. The more knowledge or skills a person has of their social environment, the greater their practical knowledge. This section

will highlight various research that demonstrates the importance of social knowledge or social skills, especially in teaching.

I. EVIDENCE FOR PRACTICAL WAYS OF KNOWING: GENERAL RESEARCH

Some well-known early psychological theories fit into Habermas's idea of practical knowing. Jung's (1960), "archetype" theory focused on the *social forms* that give rise to and support a *wisdom* tradition. Jung's idea that *wisdom* is based in *social dialogue*, thus giving it an interpersonal dimension is closely associated with Habermas's notion of a practical way of knowing. Similarly, Adler (1927), and Sullivan (1953), have stressed the importance of interpersonal relations with regards to the development of a stable and functioning personality. In addition, Erikson's (1959) work on the intrapsychic and social forces that motivate a process of personal growth, (i.e., psychosocial development), also holds much in common with Habermas's practical way of knowing. Erikson (1959) proposed that from birth to death people advance (hopefully) through various personal "psychosocial crises." Indeed, in Erikson's final psychosocial crisis the successful person attains *integrity* at the expense of *despair*, leading to Erikson's ultimate virtue: *wisdom*. Erikson, Sullivan, Adler, and Jung, among many others, recognized the role that social forces play in the growth of human beings.

Researchers, in more recent years, have had a tendency to address social development, social cognition, and the social construction of

knowledge more specifically. Their work has further defined the role of social forces in human growth. Gee (1992), for example, does so through research on the changes in thinking that result from discussing ideas in a social context. While Meacham and Emont (1989) explicitly recognize the interpersonal basis of "everyday" problem solving in ill-structured domains.

More specific to the current thesis, Kramer (1990) views the integration of affect and cognition as central to the attainment of wisdom. Kramer proposes that the individual proceeds through five socially-based skills that ultimately unify affect and cognition. These skills are: (a) recognition of individuality, (b) recognition of context, (c) ability to interact effectively, (d) understanding of change and growth, and, (e) attention to affect and cognition. For Kramer, the wise person adapts to the practical and everyday stressors of adult life via the use of these socially-based skills. Similarly, Schwartz (1977), recognized the importance of wisdom specifically in the interpersonal domain by showing that some people were more astute at transforming interpersonal dilemmas into problem formulations; Schwartz calls this ability social problem finding. With both Kramer and Schwartz there are indications that general conceptions of wisdom have a practical (social) component.

In more practically oriented research, Egan (1986) notes the intimate connection between affect and cognition in the classroom. By advocating a 'perceptual model' over the current information processing

model of cognition, Egan argues that the education system should return to the *freedom and flexibility* that once characterized learning. The way to cultivate *imagination* in the classroom, according to Egan, is to involve students in the world of ideas. Egan believes that ideas, in turn, must be situated or contextualized to be understood: we should "not give definitions of ideas but help students flexibly grasp their complexity by multiple examples (p.225)." As John Dewey proposed early in the century, Egan believes that it is crucial to embed teaching in the social context of the world.

Doyle (1986) in similar research describes six general features that summarize the social complexity of the classroom: *multidimensionality, simultaneity, immediacy, unpredictability, publicness, and history*. According to Doyle, important decisions requiring good social judgement are required by-the-minute; the classroom is a social "beehive" of activity constantly requiring the teacher's good judgement. Doyle contends that the exceptional teacher must be socially astute to deal with the social complexity of the classroom.

Clark and Yinger's (1987), prototype of the "reflective professional" also takes into account the importance of the social context of the classroom. Clark and Yinger believe that it is impossible to propose a conception of a "model teacher" without also understanding the social context of the classroom. At the most basic level, the "reflective professional" is a pre-active thinker who cannot

be taken out of the social context of the classroom and described appropriately. Therefore, representations of teaching, such as those highlighted in the previous section on technical ways of knowing, which are detached from the social context of the classroom do not embody the full scope of teaching. Goodlad (1984) concurs with this general argument, stating that a teacher's role has primarily become one of absolute decision-maker in the classroom with little or no room for student input, thus limiting student initiative and consequently social responsibility and independent learning.

Yinger and Hendricks-Lee's (1993) "ecological conception of teaching" has both expanded and refined Clark and Yinger's conception of the "reflective professional." Yinger and Hendricks-Lee built on the earlier work by specifying particular aspects of the socially dynamic classroom. For Yinger and Hendricks-Lee the ecological model leads directly to conversational properties of knowledge. In their model, knowledge is communicated via a dynamic social exchange referred to as "conversation." Conversations, in turn, occur across a variety of "systems." Systems refer to the social organizing levels of our environment. For example, there are "cultural systems": different cultures have different ways of organizing their social structure and this influences how knowledge is obtained or constructed; there are "physical systems" within cultures, different "places" influence knowledge attainment (e.g., school is a "place" where the exceptional teacher can acquire high level knowledge, whereas they may not acquire

high level knowledge in other "places"). This argument corresponds to the argument that human beings learn better in contexts that are familiar to them (see Kagan, 1984).

Another ecological system is the "social/sociohistorical". In this system the fabric of life is embedded into a social context of past, present, and future. The details of everyday life that result from being social beings in a social world are played out.

Finally, there are "personal systems" that refer to each individual's unique experiences that influence how they will attain knowledge. What we have, therefore, is a mixture of social systems that vary in their generality and thus their applicability, but yet demonstrate that the accession of knowledge is duly influenced by ecological variables. Within the classroom, the development of links among the systems enables "activity" to become appropriately "contextualized, tangible, meaning-full, and commonunal." The job of the teacher is to introduce and model new "conversations" to students that connect with established "systems."

Other evidence for a practical way of knowing, and consequently the necessity of social adeptness in the exceptional teacher, comes from motivation theory. Weiner (1979), and Dweck and Elliot (1983), have found that a learner's *motivational orientation* will greatly influence how well they will learn, and Wittrock (1984), found that students who are simply *encouraged to believe, or praised* (Wittrock, 1978) that success in school is possible, improve their performance. Research also

shows how students' (academic) self-concepts and expectations are swayed by their teacher (e.g., Stipek, 1981), which is similar to the teacher expectancy effect, or self-fulfilling prophecy (e.g., Weinstein & Middlestadt, 1979). Together, this research reveals that a socially dynamic process occurs between student and teacher impacting the motivational orientation of the student. It seems that the teachers who possess substantial practical knowledge, as expressed through social skills, are more successful in motivating their students to learn.

Evidence for Practical Ways of Knowing: Moral Research

This subsection is based on the premise that exceptional teaching has a necessary moral component, and that this moral component is related to Habermas's practical knowledge-constitutive interest. If we remember from chapter one that the definition of Habermas's practical knowledge-constitutive interest is: *a fundamental interest in understanding the environment (including other people) through interaction based upon consensual interpretation of meaning*. Then perhaps it is clear why moral behaviour is considered an aspect of practical knowledge. It is hard to see how a person could have a fundamental interest in the environment (and other people) if they did not also have a discriminating moral sense. Indeed, some studies, including the following, come to the conclusion that maintaining a high moral standard is a necessary part of exceptional teaching.

For example, Lickona (1991) states that:

...realizing the importance of the teacher-student relationship requires that the teacher have a moral vision. To be a moral educator requires seeing the moral significance of social interactions and even small events, imagining the long range effects of children's experience at school on their values and character and the kind of society they will someday help to create, seeing teaching as it was once seen - a special calling, a moral craft (Lickona 1991, p.87).

Lickona (1991) argues for the necessity of values education. In Lickona's eyes the moral decay witnessed in our society in recent years is largely due to the failing of our schools to teach the "fourth and fifth R's": *respect and responsibility*. Respect and responsibility, Lickona believes, are so ingrained into the functioning of a stable democratic society that they ought to be taught in schools. The teacher plays a fundamental role by acting as "care giver, model, and mentor."

Morality won't be important to young people if it isn't important to adults. A high school teacher puts it this way: 'We have to share ourselves, not just our subject matter' (p.79).

Goodlad (1984), like Lickona (1991), discusses the moral and ethical learnings accompanying school experiences. Goodlad, like Lickona, also stresses the importance of moral knowing for exceptional teaching. Goodlad (p. 241), finds that the "emphasis on individual performance and achievement [in modern schools] is more conducive to cheating than to the development of moral integrity." Goodlad laments that students are generally lacking anything resembling the possibility to make moral judgements. I argue that exceptional teachers, through their daily interactions with the students, foster moral reasoning. Moral reasoning is promoted in the students of exceptional teachers

because exceptional teachers are moral reasoners. They model moral behaviour and moral thought for the students in all school contexts.

II. SUMMARY OF GENERAL RESEARCH ON PRACTICAL KNOWING

The classroom is a socially dynamic environment, in which social knowledge and social skills are important for exceptional teaching. The exceptional teacher is aware of a wide and varied spectrum of social and cultural influences, and accounts for this in their teaching. Indeed, a necessary component of exceptional teaching is a vast repertoire of effective social skills, and considerable knowledge regarding the social-structure of a given environment, including an outstanding moral sense. As the excerpt from the Year 2000 document at the beginning of this section indicated, the benefits of creating a caring community with the teacher at the center cannot be overlooked.

III. EVIDENCE FOR PRACTICAL WAYS OF KNOWING: DEVELOPMENTAL RESEARCH

As in the previous section, emphasis will be placed on the importance of social skills and social knowledge for the growth of exceptional teaching. The priority in this section, however, is on developmental research.

A number of developmental theorists, Vygotsky, (1978), Labouvie-Vief (1990), Holliday and Chandler, (1986) Pascual-Leone, (1990), Rogoff, (1990), and Case, (1992) have found that social context and

environment play an important role in adult cognitive development. Vygotsky, for example, has added to Piaget's ideas about development by underscoring the role that social context plays in the development of human beings. The work of both Vygotsky and Piaget is incorporated into the work of Neo-Piagetians like Case (1992), who combine Piaget's emphasis on the growth of logical thinking and Vygotsky's emphasis on social processes into a more comprehensive theory of cognitive development.⁴ One of the consequences of this alteration of Piagetian theory is that sociocultural processes are seen as playing a greater role in development.

Rogoff (1990), for one, acknowledges that sociocultural processes play a greater role in development. Rogoff views cognitive development as an apprenticeship in which people acquire knowledge and skills by participating in socially structured activities. People learn in specific contexts through a process of guided participation in which others provide various kinds of help tailored to the person's level of knowledge and skill (within their "zone of proximal development" as Vygotsky might put it). Rogoff (p. 28) stresses that "the individual and the social world are mutually involved to an extent that precludes regarding them as independently definable." Pascual-Leone (1990; p. 91) supplements this argument by suggesting that, primarily due to the

⁴ Of course, Piaget discussed the influence of social factors and Vygotsky the influence of non-social factors on development. In this brief review I am just recognizing the major contribution of each to developmental theory.

social context in which it is embedded, adult thought continues to restructure itself "permitting a certain wisdom about human affairs."

In other developmental work the role of social context is reiterated but the focus is on the concept of wisdom directly. Brent and Watson (1980), for example, note that *special communicative skills* typical of wise individuals heighten sensitivity to verbal and non-verbal cues. The wise person is endowed with communicative skills that allow them to be sensitive to the verbal and non-verbal cues being sent to them by the person(s) with whom they interact. In similar research, Clayton (1982), defines wisdom as the ability to understand and accept the paradoxes and contradictions that mark concrete social situations. Clayton maintains that a more sophisticated type of cognition develops in the wise individual, based on a system of dialectical logic that embodies principles of paradox and change, which provides the motivation and strategies for the weighing of consequences of one's actions on self and others. In the end, developmental progress in the pursuit of wisdom leads to more complex social cognitions, which promote efficient personal and societal functioning.

Lee (1993) proposes a similar argument for the specific domain of teaching. Teaching, Lee argues, must incorporate the *feminist voice*; encouraging the cultivation of *receptiveness, responsiveness, care, and the aesthetic*. When exceptional teachers come to the classroom with confidence in their technical abilities it enables them to be socially responsive with learners. Confidence, however, is tempered by humility.

The tension between confidence and humility is represented in concern and care for themselves and their profession, as well as for learners.

According to Lee, to care in this way is to conceive of teaching as 'ethical action'; to take *responsibility* for yourself and your students. The classroom of Lee's exceptional teacher is a *democratic* one. Democratic in the sense that the classroom is a community, sensitive to, and inclusive of all persons. Teachers and learners are full partners in the educational enterprise. The teacher's role is an expression of care, as they ensure that every student has a voice, and that knowledge is not used to intimidate or overwhelm.

From my review of developmental research pertaining to exceptional teaching it has been my intention to show how difficult it is to separate individual thought from socio-cultural components. In this regard, the similarities between views of development pertaining to exceptional teaching that stress practical ways of knowing, are akin to *constructivist* views of development. For example, in Chapter one I stated that constructivism is founded on a set of social and cultural postulates that state individuals actively *construct* their knowledge based on stimulation from the social environment. In a similar way, exceptional teaching lends itself to a constructivist perspective because exceptional teachers can be seen as active pursuers of knowledge who construct and re-construct their world according to new information. Within other frameworks, such as the information processing model, the teacher is seen as a passive receiver of knowledge who develops

strategies and procedures based on past experiences in the classroom. Constructivism provides a means of describing exceptional teaching in both competence and performance terms that transcends its use in studies based on limited ways of knowing, such as expertise (Arlin, 1990).

Prawat (1992) emphasizes that teachers' adoption of the constructivist perspective may cure many of the ills bothering the education system. He describes how characteristics of constructivist teachers parallel characteristics of wise teachers, (e.g., they both recognize the inherent differences among students and therefore adopt a student-centred approach to teaching). Prawat adds that when students start to contribute to their learning, the classroom, because of the new social dynamics, becomes a more complicated place; yet, a more rewarding place, just the same. Prawat notes that most of the problems associated with implementing a constructivist approach could be overcome if teachers were willing to rethink not only what it means to know their subject matter, but also what it takes to foster this sort of understanding in students (Prawat, 1992; p.361).

Whether it is termed constructivism or not, the research reviewed in this section has been selected to show the importance of practical ways of knowing in the classroom. Most I have tried to show that exceptional teachers understand the importance of their role in the social environment of the classroom. Exceptional teachers understand that they provide experiences that help the child to *share, cooperate, respect and accept others, learn from others, develop friendships, and,*

anticipate consequences of action (Year 2000; p.27). As role models, these teachers have developed exceptional skills related to the social environment of the classroom.

3. EVIDENCE FOR EMANCIPATORY WAYS OF KNOWING

Only fools are certain and immovable (Cohen, 1958).

Emancipatory knowing was defined in Chapter one as *freeing oneself from the arbitrary forces of nature and social structures, and possible only through critical self-reflection and transcendence*, and it is the third way that wise teachers know. Evidence will be presented from a variety of sources that demonstrates the importance of emancipatory knowing for exceptional teaching. Various research on teaching will be reviewed, coming to the same conclusion: that exceptional teaching is at least partly a function of what has been described as emancipatory knowledge.

I. EVIDENCE FOR EMANCIPATORY WAYS OF KNOWING: GENERAL RESEARCH

Ideas like Habermas's emancipatory knowledge-constitutive interest are evident in a number of explorations of teaching practice. For example, Dewey (1933, 1963, 1966), Schon (1983), Egan (1986), and Greene (1973, 1988) have all proposed ideas that overlap with Habermas's emancipatory knowing.

Dewey (1933) believed that teachers have to be free to explore the child's way of thinking. Dewey was strongly opposed to teacher-directed approaches to pedagogy that emphasized "the right" way of doing something; Dewey proposed that students should *learn by doing*, because each child could then understand, *in their own way*, the important

concepts to be learned. Dewey (1966) proposed that just as the citizens of a democratic country enjoy the rights of freedom in its many forms, children are entitled the "freedom" to learn in the manner that is best for them. Teachers who utilize their emancipatory knowledge perhaps allow themselves the *freedom* to explore the child's thinking more so than teachers who do not. Therefore, teachers who are considered "free" by Dewey are likely to be teachers, who according to Habermas's definition, employ emancipatory knowledge.

Schon's (1983) concept of "reflection in action" can also be seen as emancipatory. Reflection in action refers to the practitioner's ability to think "outside" of the technical procedures and strategies that are available to them. Schon believes that professions (such as teaching) have been *over-professionalized*, meaning that they have come to rely too heavily on standardized strategies, procedures, texts, theorems, ideas and practices (though analogs are necessary as a guide for teaching practice). The process of over-professionalization of teaching is dangerous because problems in these domains do not always lend themselves to scientific, and empirical solutions. Each new instance of a problem is a unique case unto its own that requires new ways of thinking. New ways of thinking may come easier for the teacher who is an emancipatory thinker.

In a similar argument, Egan (1986) proposes that teacher planning should incorporate a "story telling model" as an alternative to the standard approach of devising unit plans and objectives that are based

on a limited (logical) view of thinking. The story telling model taps the power of children's "imagination." Imagination is like emancipatory knowing because it involves the ability to think about *possibilities*. Egan notes that no educator would deny that imagination is important to the cognitive development of children, yet it is still not incorporated widely into the curriculum. The exception, however, is that "good teachers" seem more likely to recognize the importance of children's imagination and incorporate something like the story telling model into their teaching (p.41).

Greene's (1973) conception of *teachers as strangers* also bares resemblance to Habermas's conception of emancipatory knowing. Teachers who are *strangers* are "enthused" and "wondering" bystanders in the classroom. These teachers are "strangers" in the sense of newcomers to a fascinating place. Thus, they are thoroughly engrossed in the day to day activities of the classroom. Indeed, they are fascinated by, and want to learn more about, all the activities that are going on in the classroom. Yet they are somewhat "removed from the students", thus retaining a clearer vision of their most basic goal: to integrate important aspects of the child's development.

According to Greene (1973), therefore, teachers' primary concern is the welfare of the students, teachers are said to grow as a consequence of reflecting on their interactions with pupils. By reflecting, they increase the depth of their understanding of teaching and children; they come to appreciate their deepening wisdom. The

creation of new ideas or experiences through "reflection" is the result of what Greene (1986), refers to as "positive freedom." Like emancipatory knowing, positive freedom is linked to an appreciation of the unpredictable and ineffable. Greene according to Prawat (1993, p.7) is "quite clear on this point" urging teachers to heed her plea: that is, focus on the *possibilities*⁵ rather than the problems inherent in student learning. Therefore, like Dewey, Egan, and Schon, Greene believes that a conception of thinking akin to emancipatory knowing is necessary for the growth of exceptional teaching.

Wagner (1987) provides evidence situating emancipatory knowing in the practice of exceptional teachers. Wagner argues that the thought processes of teachers in general are much more descriptive, emotional, and contradictory than most studies on teachers' thinking would lead us to believe, and that exceptional teachers make more sense of these descriptive, emotional, and contradictory thought processes. Exceptional teachers are less likely to be caught in what Wagner calls a "knot." A knot is like the Bateson (1973), idea of a "double-bind", where people's imperative demand of doing something becomes impossible precisely because they are "imperating" themselves to do it. "Knots" affect the classroom conduct of teachers by making it more stereotypical and less adequate to the situation at hand. Being "caught in knots" then, seems to be negatively related to emancipatory ways of knowing. In Wagner's

⁵ There is always more. There is always possibility. And this is where the space opens for the pursuit of freedom.

words, "there is more to teaching than just "thinking right" - most notably the ability to perceive, holistically and non-judgementally, what is actually going on in the classroom" (p. 177). Every teacher who has ever stepped into the classroom has had "knots" to deal with. Some teachers, however, have learned to deal with these situations better than others. Although the detail of Wagner's suggestions for resolving "knots" is beyond the scope of the present study, resolving "knots" takes a large dose of what has been discussed as wisdom in teaching, particularly emancipatory knowing.

II. EVIDENCE FOR EMANCIPATORY WAYS OF KNOWING: SUMMARY OF GENERAL RESEARCH

Ideas which hold much in common with Habermas's emancipatory knowledge-constitutive interest are prevalent in theoretical (Dewey, 1933; Schon, 1983; Egan, 1986; Greene, 1973) and practical (Wagner, 1987) explorations of exceptional teaching.

III. EVIDENCE FOR EMANCIPATORY WAYS OF KNOWING: DEVELOPMENTAL RESEARCH

Developmental research on dialectical thinking (Basseches, 1980; Riegel, 1973); relativistic thinking (King, Kitchener, Davidson, Parker, & Wood, 1983; Perry, 1968); uncertainty in thought (Meacham, 1983); fifth-stage reasoning (Arlin, 1975); and, postformal levels of reasoning (Labouvie-Vief, 1990; Sinnott, 1994) indicate that there is a qualitative

difference between the logic adults use to solve problems and the logic used by young adults and adolescents. The complexities of adult thinking proposed by these authors might all be categorized as ways of thinking that are emancipatory in nature.

In his research on *dialectical operations*, Riegel (1973, 1976) maintains that most of the impetus for development arises from contradictions among four aspects of individual growth: biological, psychological, social, and physical. Riegel's dialectical operations are based on "dynamic relations among systems" and therefore add to Piaget's formal operations, which emphasize "systematic relations among propositions." Riegel's *dialectics* is an interpretation of development that considers *contradictions* and *flux*, rather than correspondence and stability as the primary processes of development. (See also Basseches, 1980, 1984).

Riegel's theory of dialectical thinking, therefore, seems to be similar to Habermas's emancipatory knowledge-constitutive interest. Emancipatory knowing is all about searching out "change", "contradiction", and "flux." The individual who is a "Riegelian" dialectical thinker, must necessarily be an emancipatory knower; the essence of emancipatory knowing and this type of dialectical thinking are very similar. A difference between the theories, however, is that Habermas's is a philosophical theory of knowledge and Riegel's is a

developmental theory of thinking.⁶ The fact that one theory is primarily situated in philosophy and the other is primarily situated in development means that different aspects of human nature are emphasized. Perhaps the fact that two relatively diverse modes of inquiry have come to the same general conclusion adds credence to the existence of some high level of human functioning, whether we call it *dialectical operations* or *emancipatory knowing*.

Another example of developmental research emphasizing a way of knowing that seems to be similar to emancipatory knowing is proposed by Arlin (1975). Arlin believes that postformal operations (problem finding) may be the logical successor to Piaget's final stage of formal operations (problem solving). Just like Berliner et al. (1989), whose experts were more interested in asking, rather than answering questions about a class they were soon going to teach, or Greene (1988, p.134) who states that "teachers, like their students, have to learn to love the questions", Arlin (1990) suggests that higher level thinking may have more to do with asking rather than answering questions. For Arlin, problem finding is the process by which the most important questions are asked and the greatest discoveries are made.

In support of this claim, Arlin (1990) argues that high level thinking of young artists and scientists is fundamentally similar. That is, at some fundamental level, the thinking of great artists and great

⁶ Although Riegel did rely heavily on Hegelian philosophy to construct his theory it seems that Riegel's theory of dialectical operations is best classified as a developmental theory.

scientists is more similar than different. The fundamental similarity for Arlin (1975) comes from both great artists' and great scientists' abilities to find or reframe problems in completely unique ways so that entirely new questions can be asked. These individuals remain open to new possibilities and suggestions, sometimes from seemingly disparate sources. Therefore, the notion of exceptional teacher as problem finder in Arlin's work is comparable to the notion of the exceptional teacher as emancipatory knower in this research: both ideas stress that exceptional teachers remain free from the trappings of a particular way of thinking or particular knowledge set. The two notions are related in the sense that problem finding is a more specific concept subsumed by the more general notion of emancipatory knowing. Problem finding is an aspect of emancipatory knowing.

Foreman (1989) and Paley (1986) extend Arlin's work by showing what teachers who might be considered problem finders (or emancipatory knowers) do in the classroom. Foreman contends that exceptional teachers often provide the opportunity for children to ask "good" questions. While Paley suggests that teachers need to "listen to what the children have to say" and be truly curious about their answers. Exceptional teachers *listen* to the child's responses to the curriculum and adapt to the child's point of view, which may be very different from what the teacher had expected. With both Foreman and Paley an emancipatory way of thinking is modeled by the teacher and prompted through the teacher's interaction with the students. As Lee (1993, p. 10) states "teachers,

knowledgeable and confident in the worth of the educational process, stand humbly before the questions students raise."

Lee (1993) argues further that the teachers who ask "good" questions may be considered postformal reasoners, at least within the context of the classroom. According to Lee, attaining postformal reasoning allows individuals to hold multiple and contradictory views of the truth that bridge across belief systems, and it brings to the foreground subjective and self-referential thought. Wise individuals are not held to a priori givens but rather engage freely in the conscious breaking away from the conventional, agreed upon canons perpetuating the status quo. Exceptional teachers who reason postformally acknowledge that risks must be taken as new insights, ideas and callings endanger prior assumptions. Lee (1993), Arlin (1990), and other developmental theorists would suggest that postformal reasoning is necessary for the attainment of wisdom in teaching. I would further specify that postformal reasoning corresponds closely with the proposed conception of emancipatory knowing, with experience and reflection at the heart of each. Therefore, both postformal reasoning and emancipatory knowing play a similar role in describing wisdom in teaching.

The similarity of postformal reasoning and emancipatory knowing may indicate the usefulness of applying a developmental stage model to teaching (see also Ammon & Levin, 1993; Kamii & Clark, 1993). Implied throughout this work is that wise teaching requires some amount of time to develop, indicating that the individual goes through substantial

growth. Although the developmental literature is split on whether cognitive-developmental changes later in life are quantitatively different (Broughton, 1982), or qualitatively (Arlin, 1975; Lee, 1993), different from Inhelder and Piaget's (1958), stage of formal operations, most all agree that there is some kind of growth.⁷ I suspect that exceptional teachers have changed in some qualitative way from what they once were as teachers. These teachers may have more than just *learned*, they may have developed into qualitatively different thinkers. Therefore, despite well-documented skepticism concerning the usefulness of stage concepts (Flavell, 1982, Flavell, 1992), I believe that the thinking of the exceptional teacher is so essentially different from their novice counterparts, that explanations suggesting the differences are due solely to the accumulation of an increasing repertoire of strategies and skills are inadequate. (see Kitchener, Lynch, Fischer, & Wood; 1993).

There is a vital relationship, however, between learning and development. Just as assimilation and accommodation go hand-in-hand, so to do learning and development. Learning precedes development on the road to wisdom in teaching (Liben, 1987).⁸ Liben has focused on the

⁷ The qualitative/quantitative issue stems from Piaget's stages of cognitive development and whether or not there is a variety of thinking sufficiently different from Piaget's ultimate stage of cognitive development - Formal Operations.

⁸ In a lot of ways this research has, all along, tried to promote this type of complementarity between disparate approaches to human growth. By merging the teacher development literature, that focuses on cognition and expertise, with philosophy of teaching research, and life-

relationship between *development* and *learning* and has come to the conclusion that they are neither congruent nor in conflict, rather, they are thought better of as being complementary. Learning is exogenously driven, narrow, provoked, and nonstructural, and development is constructive, broad, spontaneous, emphasizing structural change. The essence of the distinction is that the growth process is fundamentally different for the two approaches.

Both, however, have explanatory roles to fill with regards to exceptional teaching. The relationship that Liben proposes between learning and development in general, parallels the relationship I have proposed between expertise and wisdom in teaching in the present study: learning is to development as expertise is to wisdom. That is, expertise precedes wisdom in the growth of the exceptional teacher, just as learning precedes development in general human growth. Furthermore, the culmination of learning is likely to be expertise, and the culmination of development is likely to be wisdom. Therefore, becoming an expert teacher can be accomplished through learning, whereas, becoming a wise teacher seems to require development.

Some developmental researchers (e.g., Arlin, 1990b) have referred to the structural change in thinking that leads to wisdom as postformal reasoning. It might be, however, that postformal reasoning is an aspect of emancipatory knowing, which in turn leads to wisdom in thought. If

span development literature, a model of exceptional teaching is being crafted.

this is the case, then emancipatory knowing must be considered a higher level of thought necessary for the attainment of truly exceptional teaching.

Indeed, the emancipatory dimension may be the sine qua non of wise teaching. It may distinguish the wise teacher from the expert teacher. The research cited in this section, may as a result, take on a special significance because emancipatory knowing may define the critical characteristics of truly exceptional teachers. It might be that emancipatory knowledge can only be developed after technical and practical knowledge has been firmly established.

C. RESEARCH INDICATIVE OF TECHNICAL, PRACTICAL, AND EMANCIPATORY KNOWING

Research reviewed thus far has been sorted into one of three categories based on Habermas's three knowledge-constitutive interests. This sorting was based on the belief that particular findings were much more representative of a specific knowledge-constitutive interest than any other(s). Three studies, however, could not be classified in this way because they are equally representative of Habermas's three interests. These three studies could not be classified singly under any one of Habermas's interests, therefore, they have been placed in their own separate section.

In the first study, Goodlad (1984) did a survey of American public education and concluded that schools have four broad goal areas: (a)

academic - embracing all intellectual skills and domains of knowledge; (b) *vocational* - geared to developing readiness for productive work and economic responsibility; (c) *social and civic* - related to preparing for socialization into a complex society; (d) *personal* - emphasizing the development of individual responsibility, talent, and free expression. If these goals for schooling in general are acceptable to most educators, then similar goals for what it takes to be an exceptional teacher (as proposed in this study) might be equally acceptable. Goodlad's review of the American educational system seems to confirm that good teaching is indeed multifaceted.

Jackson's (1968) interviews with 50 "outstanding" teachers similarly highlight the multifaceted nature of exceptional teaching, this time, from the perspective of "outstanding" teachers.⁹ Outstanding teachers were asked to elaborate on their views of life in the classroom. The following four paragraphs (from Jackson, pp.119-143) summarize his account of what outstanding teachers had to say about the nature of teaching. These teachers' descriptions of teaching grouped into four categories: *immediacy*, *informality*, *autonomy*, and *individuality*:

1. *Immediacy* - exceptional teachers were shown not to rely on quantified measures as indicators of how they and the class were progressing, rather the continual flow of the teaching lesson provided much more vital information - spontaneous expressions of interest, enthusiasm, etc.

⁹ Jackson relied primarily on administration nominations to select his participants.

2. Informality - exceptional teachers commented on relative informality of the classroom compared to what they had grown-up in. The feeling among the teachers was that they were quite happy with the new found freedom they had; it allowed them some flexibility in their approach to teaching.

3. Autonomy - exceptional teachers were adamant that they maintain control over their classroom; that they have the flexibility to teach how, what and when they would like because they realize that the everyday functioning of the classroom warrants this.

4. Individuality - exceptional teachers showed a decided interest in the well-being of each individual student. They take uncommon joy out of working with children.

It may be interesting to note that Jackson's categories of immediacy, informality and autonomy relate most specifically to emancipatory knowing, while individuality relates to practical knowing. There is no category produced by these teachers that relates to technical knowing. The necessary role technical knowledge plays for exceptional teaching, noted in the present study, would likely be acknowledged by these teachers but it was given little attention because Jackson's question concerned the *distinguishing characteristics* of exceptional teachers.

It might also be noted how the *distinguishing characteristics* of outstanding teachers relate to Jackson's notion of the *hidden curriculum* (Jackson, 1968; p.33-35). It seems that those characteristics that distinguish outstanding teachers seem to concern aspects of the hidden curriculum more so than the *official curriculum*. Jackson states that:

...the crowds, the praise, and the power that combine to give a distinctive flavour to classroom life collectively form a hidden curriculum which each student (and teacher) must master if he is to make his way satisfactorily through the school. The demands created by these features of classroom life may be contrasted with the academic demands - the 'official' curriculum, so to speak - to which educators have paid the most attention.

For the 50 outstanding teachers that Jackson interviewed, immediacy, informality, autonomy, and individuality "distinguished" them from their peers. In short, Jackson found through interviews with exceptional teachers, that qualities related mainly to emancipatory knowing distinguish the exceptional teacher from their non-exceptional counterpart, perhaps in a similar way it may be the case that emancipatory knowing will distinguish between wisdom in teaching and expertise in teaching, in the present study.

Holliday and Chandler (1986), in the third study, developed a general conception of wisdom using Habermas's theory. Holliday and Chandler (1986) based their conception of wisdom on *prototype theory* (Rosch, 1975), claiming that people's ideas about the structure of categories parallel the structure of the world. The descriptors for "wisdom" (among other concepts) were sorted and reduced. A principal components analysis was then used to assess the underlying structure of these concepts. The researchers found that people have a consistent conception of what it means to be wise, and that we can identify these wise people on the basis of their characteristic attributes and behaviours. People have a prototype conception of what it means to be

wise just as they have a prototype conception of any other category, (furniture, cars, etc).

Holliday and Chandler (1986) found five underlying or latent components. The first component was defined as "*exceptional understanding of ordinary experience*." This component was labeled *technical* and was defined by items such as "common sense and experience." Wisdom is indicated by the conduct of life and the management of everyday affairs.

The second component was defined as "*judgement and communication skills*", and labeled *practical*. Descriptors for this component included: aware, astute, comprehending, weighs consequences, considers points of view, and is worth listening to. For this component, wisdom is expressed in observing, analyzing, and communicating information about life.

The third component was defined as "*general competencies*." This third component was labeled *technical*. This component is defined by attributes such as: alert, intelligent, articulate, well-read, and thinks a great deal. Wisdom, therefore, is rooted in some inherent prerequisite skill.

The fourth component was defined as "*interpersonal skills*." This fourth component was labeled *practical*. Attributes that underlie this component include: fair, moral, patient, sensitive, and compassionate.

The fifth and last component was labeled *emancipatory*. Holliday and Chandler use the phrase *social unobtrusiveness* to describe this

component because of constituent attributes such as quiet, unobtrusive, non-judgmental.

The authors found that the results of their study could not be squeezed into constricting frameworks proposed by other authors, (e.g., Baltes, Dittman-Kohli, & Dixon, 1984). Rather they preferred to use the framework of Habermas (1970). They found that each one of Habermas's three knowledge constitutive interests (technical, practical, and emancipatory) was easily incorporated into their conception of wisdom. Holliday and Chandler (1986), concluded that Habermas's framework of technical, practical, and emancipatory knowledge-constitutive interests best explained the outcome components from the principal components analysis. The appealing aspect of Holliday and Chandler's conception of wisdom for the present study is its broad, yet well-defined nature; a conception of wisdom of this breadth seemed necessary to fully grasp the nature of exceptional teaching.

These studies (Goodlad, 1984; Holliday & Chandler, 1986; Jackson, 1968) are important to the proposed research because evidence for each of Habermas's three knowledge-constitutive interests is presented. That is, the exceptional teacher (Goodlad, 1984; Jackson, 1968) and the wise person (Holliday & Chandler, 1986) seem to rely on technical, practical, and emancipatory knowledge forms, simultaneously.

D. SUMMARY OF RESEARCH PERTAINING TO TECHNICAL, PRACTICAL, AND
EMANCIPATORY WAYS OF KNOWING

Habermas's theory of knowledge-constitutive interests seems to provide an adequate organizing framework for past research on exceptional teaching. For example, research from teacher education and information processing, (Berliner et al., 1989; Shulman, 1987), general developmental theory (Baltes et al., 1984; Holliday & Chandler, 1986; Riegel, 1976), social and moral education (Lickona, 1991; Prawat, 1992), philosophy of education (Dewey, 1966; Greene, 1988), along with general educational research (Goodlad, 1984; Jackson, 1968), all have important aspects that relate to Habermas's theory of knowledge-constitutive interests.

Another hopefully useful organizing tool employed in the literature review was the arrangement of the subsections according to "general research" and "developmental research." By doing so, the reader was made aware that there has been different perspectives from which research on exceptional teaching has come. More specifically, the purpose of this organization was to make it easier for the reader to understand past research in the area, and to provide a structure, from which some important points could be made. For example, I made the distinction between *learning* and *development* and suggested that growth into an exceptional teacher is best described by the process of development, although learning necessarily precedes development. In addition, throughout the literature review I made a distinction between

expertise and wisdom as the concepts that have been used most often to describe exceptional teaching. It was noted that the notion of expertise in teaching is derived from the teacher cognition literature and is primarily based on information processing models, whereas, the notion of wisdom in teaching generally comes from the developmental literature and is often the product of the constructivist model.

E. ASSUMPTIONS OF THE STUDY

The major assumption made in the present study is that embedded in the discourse of our culture is a common conception of exceptional teaching. One of the main questions in this study is whether a conception of exceptional teaching "exists in the minds of people." To get an initial gauge of this question, a pilot project was used to ask practicing teachers to *"describe what it means to be a wise teacher."* The contention that ideas about what it means to be a "wise" teacher are part of our everyday language was supported. That is, teachers responded readily and had lots to say. Furthermore, the responses showed that teacher's beliefs about the nature of wise teaching are varied. Some responses emphasized the wise teacher as "intelligent", "smart", and "knowledgeable," while other responses showed the wise teacher to be "caring", "sensitive", and "open-minded."

In another pilot project grade five and six students responded to the following two questions:

1. *Generate a list of attributes or characteristics judged by you to be especially descriptive of teachers who are "experts."*
2. *Generate a list of attributes or characteristics judged by you to be especially descriptive of teachers who are "wise."*

The responses to the first question indicated that technical knowledge was the most important aspect of "expert" teaching. Responses to the second question indicated that the most important characteristics of exceptional teaching seemed to concern practical and emancipatory knowledge. These positive preliminary results led to further refinements in the methodology and provided the impetus to further investigate the present model of exceptional teaching.

F. DELIMITATION OF THE STUDY

Despite the obvious progress made in recent years with intuitive aspects of human functioning, including wisdom, it is still an elusive concept. Augmenting the belief that wisdom is a nebulous concept are highly interpretive statistical procedures that will be used to construct a definition of wisdom. Therefore, inferential empirical analyses combined with a tacit concept such as wisdom, may "stretch" the scientific method. As Baltes and Smith (1990) state, any study of complex concepts through the scientific method (specifically the reduction of people's thoughts and ideas to manageable forms) may immediately confound the concept as it is known in the language and culture with the procedures used to analyze these concepts. To deal with these potential limitations the researcher intends to ask participants

directly how they would describe a wise teacher, and by grounding the theoretical findings of the first phase with more practical second and third phases. Also the researcher has made specific predictions concerning how the data will unveil itself. As a result, specific hypotheses made about the outcome of the data analysis may increase the scientific rigor of this study because there is little room for "hunting."

A second potential limitation is that this study of wisdom is situated in teaching. One cannot generalize to the study of wisdom in other contexts.

G. GENERAL RESEARCH QUESTION AND SPECIFIC RESEARCH HYPOTHESES

1. GENERAL RESEARCH QUESTION REVISITED

Based on the results of the pilot work and an analysis of the appropriate literature, the main research question was formulated. Can a model of exceptional teaching be specified?

2. HYPOTHESIS IA

Using a principal components analysis descriptors of wise teaching will group together to form three orthogonal constructs: (a) technical, (b) practical, and, (c) emancipatory. Each of these constructs is expected to account for a significant proportion of variance that explains wise teaching.

I. RATIONALE FOR HYPOTHESIS 1A

Throughout the study it has been emphasized that "wise teaching" is a simultaneously technical, practical, and emancipatory way of knowing. Considering the literature review, it should be clear by this point that wise teaching must necessarily involve all three of Habermas's knowledge-constitutive interests.

The constructs are deemed orthogonal because these constructs represent the three distinct ways that human beings can know their world. Therefore, although each way of knowing necessarily contributes to a final picture of the way we can know our world, the presence of one way of knowing (in any particular person) does not necessarily lead to the presence of the other two ways of knowing. Indeed, one of the main outcomes of this study will be to show the robustness of these three aspects of exceptional teaching in that they can be identified as distinct entities through various methodological procedures.

Implicit theories approach

Four studies (Baltes, Dittman-Kohli & Dixon 1984; Brent & Watson, 1980; Clayton & Birren, 1982; Holliday & Chandler, 1986) have provided the data analytic prototype for the present study. Consistent results across these studies point to similarities in how people view "wisdom." All of these studies have a common methodology, which has been described by Sternberg (1990) as an *implicit theories approach*. The authors of these studies asked respondents to describe "wisdom" (among other

concepts) in their own words.¹⁰ With this approach respondents' descriptors are collected, sorted and reduced to a non-overlapping list of descriptors. Then a second group of respondents rate the descriptors according to how representative or typical they are of wisdom. The ratings for this list of descriptors is then run through a statistical process (i.e., principal components analysis or multidimensional scaling) that clusters the descriptors into meaningful constructs. Figure 2 provides information on each of these four studies with regards to: type of analysis, the components found, and how these components relate to Habermas's knowledge-constitutive interests.

¹⁰ In an explicit approach, theories are developed from people's measured performance on ability tests or cognitive tasks presumed to be indicative of intellectual functioning. With implicit approaches, people's actual ideas or beliefs about a certain concept are tapped. They are asked more directly about their beliefs, rather than having their beliefs inferred through a particular task.

Figure 2

Research Based on Implicit Approaches that Describe Wisdom

	Technical	Practical	Emancipatory	
Brent+Watson (1980)	person-cognitive	practical-experiential interpersonal moral-ethical		Principle Components Analysis
Clayton+Birren (1982)	cognitive	affective	reflective	Multidimensional Scaling
Baltes, Dittman-Kohli, +Dixon(1984)	mechanics	pragmatics		Principle Components Analysis
Holliday+Chandler (1986)	exceptional understanding general competence	judgment+communication interpersonal	social unobtrusiveness	Principle Components Analysis

The symmetry among these findings for wisdom in general has led to the expectation that "wisdom in teaching" may have a similar underlying structure. All these findings share some commonalities. All have a cognitive/intellectual dimension; all have a practical/social dimension; and at least two of the studies recognize an emancipatory dimension. From these studies the relative robustness of a conception of wisdom is apparent. Such a finding validates the belief that a stable conception of wisdom is in the minds of people. The question is, will a stable conception of wisdom in teaching also be "in the minds of people"?

Wisdom as a prototype conception

Rosch (1975) theorized that psychological categories reflect the structure of the world. Category members possess clusters of variably correlated attributes; some attributes being more representative of a category than others. For example, most things that we call cars have engines and four wheels, while less common in cars are back seats or doors (e.g., racing cars). Important, however, is that a car is still a car even without some of its most important features, (i.e., we still call a racing car a "car" even though most do not have doors or back seats). Rosch went on to define three levels of categories. They are *superordinate*, *basic*, and *subordinate*, with the basic level category being the most practical for use in everyday human interactions. For example, fruit, apple, McIntosh represent the three levels of categories. Fruit is a superordinate category, apple is a basic level category, and McIntosh is a subordinate level category.

Vital for the present study is Rosch's notion of *prototypicality*. Prototypicality suggests that some concepts are better instances of categories (prototypes) than others. For example, apple is a more prototypical example of a fruit than is a mango (at least in our culture). The development of the idea of prototypicality ratings means that category membership is no longer an all or nothing affair, as it had been with traditional concept theory. Instances of a subordinate category like McIntosh, Gala, Golden Delicious, Spartan, and Granny Smith can be rated for their typicality to the basic concept of apples; or, apples, oranges, kiwi, mangos and cantaloupe, can be rated for their typicality to the superordinate concept of fruit. Therefore, some types of apples are more typical apples, and some types of fruit are more typical fruit. The introduction of categories based on prototypes, although offering a great deal to the way we view concepts, also makes it difficult to precisely define concepts. The concepts of brother-in-law or equilateral triangle, for example, are traditional concepts that can be precisely defined. The great majority of concepts, however, cannot be defined in this way.

In the present study, respondents may produce descriptors (categories) like intelligence, fairness, experience, creativity, patience, etc., and these will be rated for how typical they are of "wisdom in teaching." It is important to be aware that because categories are based on prototype ratings the boundaries between teachers who possess varying degrees of that category fade into each

other. There is no perfectly wise teacher, and there is no black and white distinction between a teacher who is wise and one who is not. When wise teachers are discussed, we are talking about persons who resemble, although do not perfectly match, a hypothesized ideal or prototype.

3. HYPOTHESIS IB

One-tailed *dependent samples t-tests* will reveal that mean ratings for the descriptors that compose emancipatory knowledge on the wisdom scale will be statistically higher ($P < .05$) than the mean rating for the descriptors that compose technical knowing and practical knowing. There will be no statistical difference between the mean ratings of technical and practical knowledge dimensions.

I. RATIONALE FOR HYPOTHESIS IB

It was proposed in the literature review (p.78) that emancipatory knowing may be the sine qua non of "wise teaching." Thus, the importance of emancipatory knowing as compared to the other knowledge-constitutive interests may be reflected in participants' ratings.

4. HYPOTHESIS IIA

Descriptors of expert teaching will group together to form two orthogonal constructs: (a) technical, and (b) practical. Both of these constructs are expected to account for a significant proportion of variance that would explain exceptional teaching. The construct of

emancipatory knowing might also be found, but its contribution to the variance that constitutes expertise in teaching is hypothesized to be negligible. In short, participants are expected to confirm that emancipatory knowing is not an aspect of "expertise in teaching."

I. RATIONALE FOR HYPOTHESIS IIA

Throughout the study it has been emphasized that "expert teaching" is mainly a technical, and to a lesser extent, a practical way of knowing.

5. HYPOTHESIS IIB

A one-tailed *dependent samples t-test* will reveal that mean ratings for the descriptors that compose technical knowing on the expertise scale will be statistically higher ($P < .05$) than mean ratings for the descriptors that compose practical knowing. The same hypothesis will apply if an emancipatory component is found.

I. RATIONALE FOR HYPOTHESIS IIB

Studies on expertise in teaching revealed that the primary basis for the teachers' expertise is technical knowledge.

6. HYPOTHESIS III

Comparisons will be made between constructs found with the "wisdom in teaching" rating scale (hypothesis I) and constructs found with the

expertise in teaching rating scale (hypothesis II). One-tailed independent samples t-test will reveal the following results:

(a) a mean rating for the descriptors that compose technical knowing on the "expertise scale" will be statistically higher ($p < .05$) than the mean rating for the descriptors that compose technical knowing on the "wisdom scale."

(b) a mean rating for the descriptors that compose emancipatory knowing on the "wisdom scale" will be statistically higher ($P < .05$) than the mean rating for the descriptors that compose emancipatory knowing on the "expertise scale" (if an emancipatory component is found on the expertise scale).

I. RATIONALE FOR HYPOTHESIS III

Throughout much of the review of the literature two competing views of exceptional teaching have been stipulated: exceptional teaching as "expertise" and exceptional teaching as "wisdom." These two views of exceptional teaching will be systematically assessed, to determine the viability of each.

7. HYPOTHESIS IV

It is hypothesized that the deft reconciliation of two questions will distinguish teachers assumed to be closer to the prototype conception of wisdom. The questions are:

1. What is your definition of teaching and the best way that teachers teach?
2. What is your definition of learning and the best way that students learn?

Specifically, department heads, who are considered closer to the prototype of a "wise" teacher, are hypothesized to exhibit a greater variety and number of responses (Ericson & Simon, 1980), associated with the three components of wisdom in their answers to these questions. Department heads' responses to the above questions, will acknowledge the complementary role of the three knowledge-constitutive interests hypothesized in Phase I to underlie wisdom in teaching. Or more simply, department heads' responses will be more characteristic of "wise" (as defined in phase I) responses to two important questions in education.

I. RATIONALE FOR HYPOTHESIS IV

The researcher felt it was necessary that the first phase of the study be grounded in the thoughts of practicing teachers. Kekes (1983), points out that it is important to verify that what is measured in theory is occurring in the practice of those hypothesized to be wise. As Meacham (1990; p.184), states "wisdom lies not in what the person knows, but in how the person uses the knowledge he or she has." Therefore, will a group hypothesized as being closer to a prototype conception of wisdom (department heads) espouse "wiser" thoughts in response to two questions about their views of teaching and learning?

Other researchers have examined how teachers think about general questions such as these, which concern teaching and learning. Prawat (1992), for example, comes to the straightforward, yet important conclusion, that "teacher's views of teaching and learning influence their classroom practice" (p. 356). While Greene (1986, p. 78), notes that stimulating teachers' thinking about teaching and learning "summons alternative realities for those sunken in what seems given." "Alternative realities" for Greene is the ability of the teacher to think beyond the traditional teacher-centred classroom model. In doing so, teachers open themselves up to a wider range of ways that they can teach, and students can learn. Student teachers (novices), teachers and department heads "alternative realities" of teaching and learning will be evaluated. Department heads are hypothesized to have more such "alternatives."

8. HYPOTHESIS V

An extended observation of a teacher deemed to be highly typical of a "wise" teacher will be undertaken. It is hypothesized that the underlying components of wisdom described in phase one will be readily evident in this teacher's practice.

I. RATIONALE FOR HYPOTHESIS V

The rationale for this hypothesis is similar to that of hypothesis III but is extended into the actual practice of teaching. The logic is

that underlying components of wisdom described in Phase one should be evident in the practice of a teacher defined as wise. Although, all three of Habermas's ways of knowing should be evident in this teacher's practice, what might set the practice of "wise" teachers apart from other teachers is emancipatory knowing. Therefore, evidence for emancipatory knowing (if it is available from this teacher's practice) will be emphasized.

9. SUMMARY OF THE HYPOTHESES

The seven hypotheses of the present study are:

Ia. Descriptors of wise teaching will load on three orthogonal constructs: (a) technical, (b) practical, and, (c) emancipatory.

Ib. Mean ratings for the descriptors that compose emancipatory knowledge on the wisdom scale will be statistically higher than the mean rating for the descriptors that compose technical knowing and practical knowing.

IIa. Descriptors of expert teaching will load on two orthogonal constructs: (a) technical, (b) practical.

IIb. On the expertise scale the mean rating for the descriptors that compose technical knowing will be statistically higher than the mean rating for the descriptors that compose practical and emancipatory knowing.

III. A mean rating for the descriptors that compose technical knowing on the expertise scale will be higher than the mean rating for

the descriptors that compose technical knowing on the wisdom scale. A mean rating for the descriptors that compose emancipatory knowing on the wisdom scale will be higher ($P < .05$) than the mean rating for the descriptors that compose emancipatory knowing on the expertise scale.

IV. Department heads, who are considered closer to the prototype of a "wise" teacher, are hypothesized to exhibit a greater variety and number of responses (Ericson & Simon, 1980), associated with the three components of wisdom in their answers to three questions of educational significance.

V. The underlying components of wisdom described in phase one will be readily evident in the practice of a teacher believed to be wise.

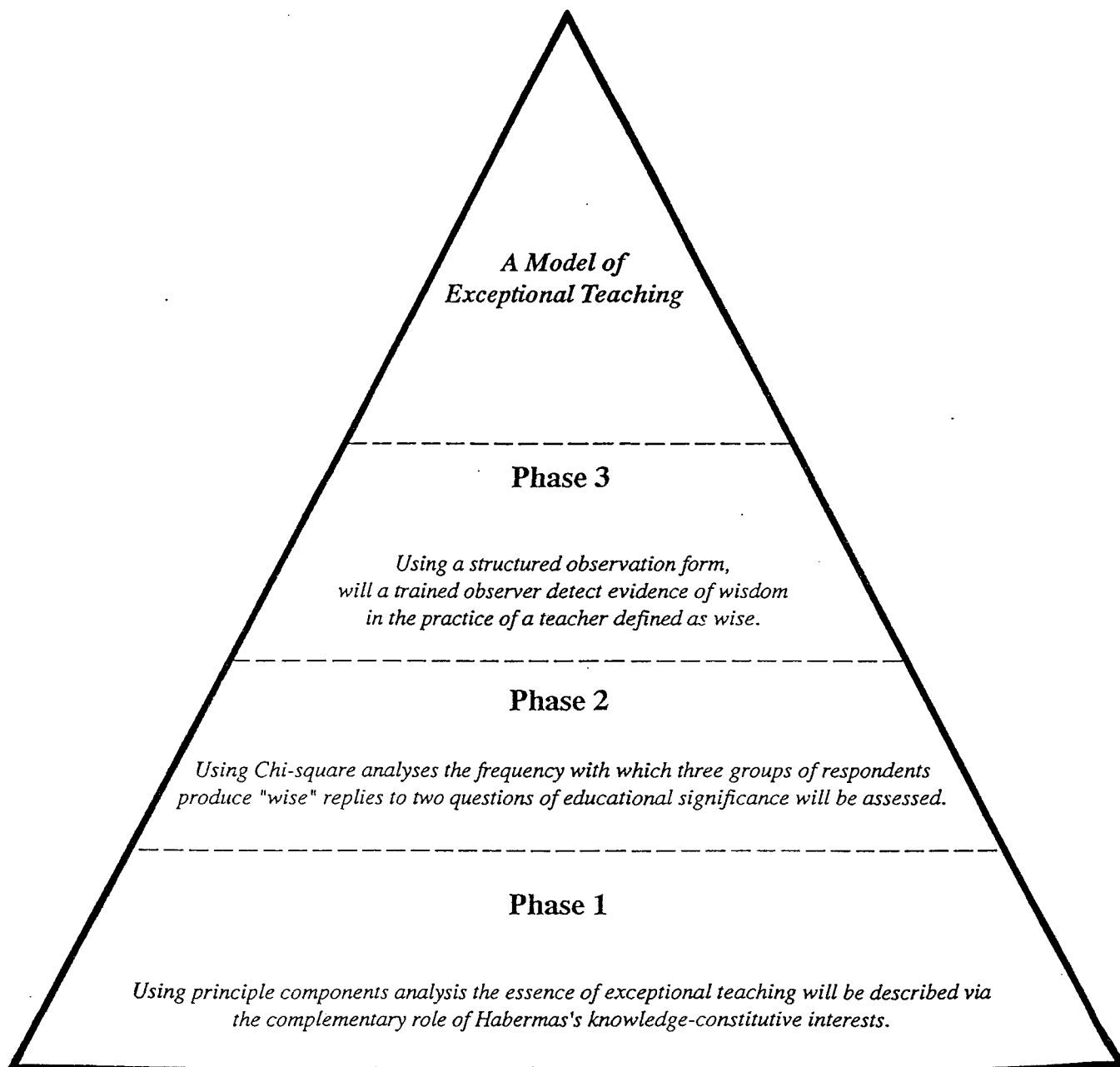
III. METHODOLOGY

A. OVERALL DESIGN AND ANALYSIS OF THE STUDY

Three phases were incorporated into the overall design and analysis of this study. In the first phase, quantitative support for the research hypotheses was attained. In the second, additional quantitative support for the phase one findings was pursued. In the third phase, qualitative support for the phase one findings was pursued. In the first phase, the researcher will attempt to establish a framework for exceptional teaching, based on the results of a principal components analysis. In the second phase, a determination will be made as to whether the components elicited from the principal components analysis, thought to reflect wisdom in teaching, are actually present in teachers' thinking about two important questions in education. In the third phase, an attempt will be made to further validate the results for the first phase through the intense observation of a single teacher considered prototypically "wise." (See Figure 3 for a summary of the study).

Figure 3

Overview of the Design



B. PHASE 1

1. DESIGN OF PHASE 1

There were two steps to the analysis in phase one of the study. The first step involved collecting attributes of "wise" or "expert" teachers. Respondents were asked to list "descriptors"\ "characteristics" that best reflect a "wise" teacher, while additional respondents were asked to list "descriptors"\ "characteristics" that best reflect an "expert" teacher.

In the second step, another sample of respondents used a likert scale to rate a distilled version of the descriptors obtained from the first group of respondents for the degree to which they exemplify a "wise" teacher. Additional respondents rated a distilled version of the descriptors obtained from the first group of respondents for the degree to which they exemplified an "expert" teacher. A principal components analysis was run on these ratings to determine their latent structure.

I. PARTICIPANTS: STEP 1

A total of 60 students from a large post-baccalaureate teacher education program participated in step one of phase one of the study. Thirty respondents completed a task that required them to list attributes of a "wise" teacher. Thirty respondents completed a task that required them to list attributes of an "expert" teacher. Thirty respondents were selected for each task because this number of

respondents produced an adequate pool of descriptors to comprehensively describe both wise and expert teaching. Student teachers were selected for this study because of the ease of access to this particular sample of people. Chandler and Holliday (1986) and Sternberg (1985) suggest that the use of a convenience sample will not influence the results of the study because the majority of adults in our society are expected to have a comparable conception of wisdom and expertise in teaching.

II. MEASURING INSTRUMENTS AND PROCEDURE: STEP 1

The following two statements appeared at the top of an otherwise blank piece of paper.

1. *Generate a list of attributes or characteristics judged by you to be especially descriptive of teachers who are "experts."*
2. *Generate a list of attributes or characteristics judged by you to be especially descriptive of teachers who are "wise."*

The following instructions adapted from Holliday and Chandler (1986) were read and made available to participants before they were asked to complete the task.

This is a straightforward study to find out the characteristics and attributes that people feel are common to teachers. At the top of your sheet you are asked to spend no more than five minutes and list attributes and characteristics of a certain kind of teacher. Try not to free-associate. For example, if the statement at the top of the sheet reminds you of a friend, do not write down your friend's name then their favourite colour. The task does not involve naming specific individuals but listing the characteristics of certain kinds of teachers. Please do not refer to any books, dictionaries, or other people while completing this task. I am only interested in your conceptions of different kinds of people. Please remember that your participation is strictly voluntary and you may withdraw at any time.

Thank-you for your participation.

Respondents were given as much time as they need to complete their respective tasks.

The main purpose of the compilation of these descriptors was so that they could be used in the next step of the analysis. Descriptors were included in the next step if they were part of larger collection of five or more analogous or thematically related descriptors. The decision whether descriptors were similar was based on the use of dictionaries and thesauruses. Two independent raters produced their own distilled versions. Differences between the raters were decided upon by a third party not involved in the original ratings.

III. PARTICIPANTS: STEP 2

An additional 100 respondents from the same teacher education program participated in step two of phase one.

IV. MEASURING INSTRUMENTS AND PROCEDURES: STEP 2

Using an 11 point scale, that ranged from 0 - "not at all", to 10 - "highly"¹, 50 participants were asked to rate each descriptor (elicited from step 1) in terms of how typical it was of a "wise" teacher. Similarly, 50 participants were asked to rate each descriptor (elicited from step 1) in terms of how typical it was of an "expert" teacher. The instructions in this step of phase one were adapted from Holliday and Chandler (1986), who, in turn, adapted them from Broughton (1984). Descriptors in both the wise and expert teacher rating scales were presented in varying order.

V. ANALYSIS: STEP 2

The following analyses were run on the prototypicality ratings from the "wisdom" and "expertise" scales.

A. To assess internal consistency of the scaled items for both the "wise" and "expert" scales the inter-item correlation coefficient using Cronbach's Alpha was computed.

B. Descriptive statistics appraising the central tendency and variability of scaled items, were collected. The mean ratings were used to pursue some comparisons.

¹ Holliday and Chandler (1986) used a 7 point scale and noted that it may have restricted participant variation in responses. An 11 point scale, as well as an emphasis in the instructions to "use the whole scale" reduced floor and/or ceiling effects in the present study.

C. Following Holliday and Chandler (1986), an assessment was made to determine whether the frequency of the prototype ratings for the "wise" and "expert" descriptors in step 1 are a function of the magnitude with which those descriptors were endorsed in step 2. Both a Pearson Product Moment correlation and a Point Biserial correlation were computed for both samples. Moderate positive correlations were expected because there should be at least a moderate positive relationship between the frequency that one group of participants endorses certain descriptors of wisdom and expertise and the magnitude that another group assigns these same descriptors.

D. In the most crucial aspect of the phase I analysis a principal components analysis, using a varimax criterion, was conducted on the prototypicality ratings. Based on the prototypicality ratings, the underlying structure of both the "wisdom" and "expertise" scales was assessed for the purpose of understanding exceptional teaching. To determine whether descriptors can be theoretically and statistically linked to a construct, two criteria were used. The first criterion was substantive meaning; were the descriptors that pooled together to form a construct interpretable from the perspective of the research hypotheses. The second criteria was statistical. Was there a substantial gap between primary ("home") components and secondary ("away") components that descriptors loaded on. In this study, the minimum gap was chosen to be .20. This would mean, for example, that if a descriptor loads on a primary component .70, then this same descriptor could not load on any

other component more than .50. A gap of this size provided some assurance that a particular descriptor would be specific to one construct.

C. PHASE 2

1. DESIGN OF PHASE 2

A determination was made as to whether the components elicited from the principal components analysis, thought to reflect wisdom in teaching, were actually present in teachers' thinking about two important questions in education. The purpose of this analysis was to determine if the responses to these questions can be broken down into meaningful segments that correspond to technical, practical, and emancipatory components. If participants' responses to these questions can be broken down into segments that correspond to Habermas's interests, it would support the findings of the principal components analysis by showing that people's implicit theories of "wise" teaching are also present in their personal philosophy of teaching. Whether or not a particular teacher has "deftly" answered either of these questions will depend on the degree to which they have utilized Habermas's ways of knowing. Thus, I would expect that teachers characterized as "wise" would respond with answers also characterized as "wise." That is, incorporating all three aspects of Habermas's knowledge-constitutive interests. Also I might expect that more often the department heads, as

compared with the other two groups, would demonstrate evidence of an emancipatory way of knowing in their answers.

Using binary coding, Chi-Square analyses were run to determine if the frequency with which the three groups' responses differ. That is, respondents showing any evidence of technical, practical, or emancipatory knowing were credited with thinking in that way (coded as 1). There is no difference in my calculations among respondents who have one statement relating to technical, practical, or emancipatory knowing, and respondents who have more than statement. The important point is that Habermas's ways of thinking were present or not. For each question, three independent Chi-Squares were computed to compare the use of technical, practical, and emancipatory knowledge across respondents. For each question, the use of technical, practical, and emancipatory knowledge was made within respondents. Therefore, a total of six Chi-Squares were computed for each question.

I. PARTICIPANTS

Three groups of teachers were used in this phase of the analysis. The least experienced group (novice) were 15 student teachers. The second group were 15 teachers (regular inservice) from Lower Mainland schools with no special assignments or training. The third group were 15 department heads. Rowles (1991) advises that the use of department heads as a high status group of teachers is potentially useful. First, because of their subject matter expertise. Second, because of their nomination

by peers or administration to the position of department head. In this regard, district criteria for nominating certain teachers for the position of department head seems to be in accordance with descriptions of exceptional teachers as technical, practical, and emancipatory knowers (Rowles, 1991). Third, British Columbia has no official system of recognition for teachers who do an exceptional job (e.g., recognized as Master Teachers). As a result, it might be argued (as Rowles, 1991 does) that within the ranks of department heads there is an usually large number of teachers who might be considered exceptional.

II. EMPIRICAL QUESTIONS FOR PHASE 2

All participants were given the following questions to respond to in writing:

What is your definition of learning? What is your view of the best ways that pupils learn?

What is your definition of teaching? What is your view of teaching, and the best way to teach?

D. PHASE 3

1. DESIGN FOR PHASE 3

The findings from the final phase of the analysis will hopefully support the first two phases of the study. An assistant recruited by the researcher observed an eminent teacher over five one-hour sessions. Through observation by this assistant the researcher attempted to

corroborate actual classroom observations of an exceptional teacher with the findings from the principal components analysis performed in phase one and the qualitative analysis from phase two. In short, does a teacher considered "wise", display the technical, practical, and emancipatory characteristics described in this study to be indicative of wisdom in teaching?

I. PARTICIPANT

The participant for this portion of the analysis teaches grade 7 math at a Lower Mainland elementary school. There were three primary reasons why this particular individual was chosen as representative of "wise" teachers. First, she has 24 years of teaching experience. Second, she was highly recommended as suitable candidate by a number of her colleagues. Third, I had the opportunity to be a student in a class in which she taught and became convinced she would be a suitable candidate to observe as a "wise" teacher.

II. PROCEDURE

Observation of the aforementioned teacher was undertaken over a three week period. During this time a trained assistant observed this teacher's classroom five times. Each session was one hour long. The trained observer was not told about the nature of the study. In this way, the potential bias associated with the belief that this may be a "wise" teacher was negated.

Notes from each day were collected on a form specifically designed for this task. There was one form for each observation session. The form used was exactly as follows (except that space was provided for the observer to write):

Date _____
Time _____
Grade _____
Number of Students _____

1. Comment on any of the following aspects of this teacher's teaching: *descriptors that relate to technical ways of knowing*. Use specific examples from the teaching you observe.
2. Describe this teacher's interactions with the students. Use the following descriptors to guide your observations: *descriptors that relate to practical ways of knowing*. Use specific examples from the teaching you observe.
3. Comment on the following aspects of this teacher's teaching: *descriptors that relate to emancipatory ways of knowing*. Use specific examples from their teaching where possible.

The three questions on this observation form reflect Habermas's three ways of knowing. The research assistant will base her comments on descriptors taken from the final rotated components of the principal components analysis on wisdom in teaching.

IV. RESULTS

A. GENERAL FINDINGS

A model of exceptional teaching was specified based on the results of the analyses, thus confirming the principal research question in the study. Evidence for the model came from three converging sources. First, an empirical model for exceptional teaching was established, based on the results of a principal components analysis. Second, the components elicited from the principal components analysis, thought to reflect wisdom in teaching, were shown to be present in teachers' thinking about two important questions in education. Third, the description of exceptional teaching (as wisdom) used in this study was evident in the practice of a teacher considered "wise."

B. PHASE 1 FINDINGS

The first six steps of the data analysis in phase 1 set the stage for the section of the analysis that deals specifically with the hypotheses. These initial sections established the credibility of the data.

1. GENERATING ATTRIBUTES: SETTING THE STAGE

In the first step of phase 1 non-redundant category descriptor lists were formed by first transcribing participants' responses, then,

combining synonymous or thematically-related descriptors.¹ Two independent raters accomplished this task. The raters compiled individual lists of synonymous or thematically-related descriptors for the wisdom and expertise samples. The final independently produced raters' lists were compared based on percentage of agreement of descriptor categories (Wentzel & Erdley, 1993).² For both the wisdom and expertise descriptors there was 96 percent (23/24 wisdom and 22/23 expertise) agreement on the categories that were eventually used for the respective rating scales.

A copy of the final list of descriptors for both "expert" and "wise" samples can be viewed in Appendix A. A total of 274 descriptors for "wise teachers", and 230 descriptors of "expert teachers" were garnered. The mean number of descriptors per person for "expert teachers" was 7.67 (sd=2.87) and for "wise teachers" was 9.13 (sd=3.03). The difference in the overall number of descriptors was likely due to wisdom being a richer conceptual category than expertise.

In another analysis the percentage of overlap between descriptors of the two competing notions of exceptional teaching was assessed. An index of concept overlap developed by Holliday and Chandler (1986) was used that utilized a scale from 0 - 100 percent, with zero indicating no

¹ Webster's New Dictionary and Thesaurus (1990) was the reference guide for this task.

² A descriptor category was determined to be "in agreement" if at least 80 percent of the descriptors that compose that category were similar across raters.

Results

overlap and 100 meaning complete overlap. The results are summarized in Table 1.

Table 1

Overlapping descriptors of "wise" and "expert"
teachers

DESCRIPTORS (in alphabetical order)	EXPERT=E	WISE=W
accountable	E	
acknowledges individual differences	EW	
active	W	
allow students to learn through discovery	E	
anticipates problems before they start	EW	
approachable	EW	
calm	EW	
careful	W	
caring	EW	
challenges students	E	
charismatic	E	
classroom awareness	EW	
communicates clearly	EW	
computer literate	E	
confident	W	
consistent	EW	
cooperates with co-workers	EW	
creates positive classroom environment	E	
creative	EW	
dedicated	EW	
democratic	W	
direct-not control the classroom	W	
disciplined classroom manager	EW	
encouraging	EW	
enjoys working with children	E	
enthusiastic	EW	
experience with subject area	EW	
experienced in life	W	
fair	EW	
focus on concepts not facts	E	
generous	W	
gives students space	W	
goal oriented	E	
good judgment	EW	
happy	W	
healthy	EW	
honest	EW	
humble	W	
inspirational	W	
intelligent	EW	

Results

interested	EW
interesting	E
knows that they cannot know everything	W
moral consistency	W
objective	EW
older	EW
open-minded	EW
organized	E
patient	EW
perceptive	E
popular	W
professional	E
proud	W
reflective	EW
representative	E
respected by students	EW
respectful of students	EW
responds to students' needs	E
self-evaluative	W
sense of humour	EW
socially aware	W
tactful	W
teaching relates to student experiences	EW
thick-skinned	W
thorough knowledge of subject area	EW
thought provoking	W
tries different teaching styles	W
trustworthy	E
understanding	EW
unorthodox	E
unpredictable	E
will search out information	W
willing to change or evolve	E
with-it	EW
worldly	W

UNIQUE DESCRIPTORS: EXPERT	19
UNIQUE DESCRIPTORS: WISE	25
COMMON DESCRIPTORS	30
TOTAL NUMBER OF DESCRIPTORS	74

Results

In keeping with categorization theory it is expected that "expert" and "wise" teacher categories will overlap moderately because of the basic similarity between these concepts. Results indicated that there were 19 unique descriptors for the "expert" question, 25 unique descriptors for the "wise" question, and 30 descriptors were shared. When the 30 shared descriptors are divided by the 74 total descriptors a value of 40.5 percent is obtained. Therefore, about 40 percent of the descriptors for "wise" and "expert" teachers overlap, that is indicative of moderate overlap.³

From this simple analysis we also see more evidence that "wise" teaching might be viewed as a more conceptually rich category. Of the 74 unique descriptors 25 (34%) registered for "wise" teaching alone, while 19 (26%) registered for "expert" teaching. People generated more unique descriptors for the "wisdom" category than the "expertise" category.

The main purpose of the compilation of these descriptors, however, was so that they could be formed into prototypical groupings for the next step of the analysis. Descriptors were included in the next step if at least five analogous or thematically related items could be grouped together. A frequency of five seems to provide a reasonable compromise

³ The degree of overlap increases, however, if we consider only those descriptors that are used on the "expert" and "wise" prototypicality scales. In this case, 15 descriptors out of 24 (62.5%) for the "wise" scale and 15 descriptors out of 23 (65%) for the "expert" scale overlap. These results indicate that as expected there is a certain degree of similarity or overlap between people's ideas of wisdom and expertise in teaching when a simple listing of descriptors is evaluated.

with regards to the issue of determining whether a certain descriptor or characteristic represents people's everyday conceptions of exceptional teaching.⁴ That is, if the cut-off point was less than five then there is a greater chance that descriptors, that did not address the research question, would be included in step 2 of the analysis (see Wentzel & Erdley, 1993 for a similar strategy). If the cut-off point was more than five then there is a greater likelihood that important descriptors of exceptional teaching would be excluded. Indeed, the reader might wonder whether the researcher was too conservative with regards to his cut-off point. In response to this question, the researcher wanted to err on the conservative side because he wanted some control over the number of descriptors that entered into the principal components analysis. The researcher believed that if he kept the number of descriptors below 25 there would be a better opportunity for a result that less ambiguously supported the hypotheses of the study. For example, Holliday and Chandler (1986) used many more descriptors in a conceptually similar principal components analysis and the results showed that many more descriptors entered into final components, thus making these components difficult to interpret. Over five components the number of descriptors ranged from 5 to 25 with a mean of 16.4 descriptors per component.

4 The potential usefulness of the above procedure was demonstrated in earlier pilot work. For example, by observing the pattern of responses given by participants in pilot work it seemed that five descriptors was a suitable cut-off point.

Results

Support for subscribing to five as the cut-off point might also be taken from the view that all descriptors represent one of the three ways of knowing. If this is the case, then a subsample of the most commonly occurring descriptors might not only represent each of the three ways of knowing, but represent these ways of knowing best. Thus, the relative structure of the results of a principal components analysis is expected to stay the same as it would for a larger number descriptors. The number five allows for an interpretation of the principal components analysis unencumbered by a large number of descriptors (e.g., Holliday & Chandler, 1986).

In order to assess the usefulness of adopting a cut-off of five the reader may wish to view all of the descriptors for the wise and expert scales in Appendix A. Of the total of 230 descriptors listed in Appendix A, for expertise in teaching, 196 (85%) were included in step 2 of the analysis. In terms of unique descriptor categories 23 out of 45 (51%) were used in step 2 of the analysis. For wisdom in teaching there were 274 descriptors in total, with 188 (69%) included in step 2. The percentage of unique wisdom descriptor categories used in step 2 was 42 (24\57). Thus, by applying the cut-off point of five descriptors the researcher was left with 23 descriptors of "expert teachers" and 24 descriptors of "wise teachers." See Appendix B for the "expert" and "wisdom" scales that were formed based on these descriptors.

2. RELIABILITY OF THE SCALES

To assess internal consistency of the scaled items for both the "wise" and "expert" scales the inter-item correlation coefficient using Cronbach's Alpha was computed. Results indicated that both the "wise" $r=0.89$ and "expert" $r=0.86$ scales demonstrated adequate internal consistency of scaled items.

3. VALIDITY OF THE SCALES

Content validity for this study was obtained through the comparison of descriptors found in this study to descriptors found in other studies that measure "wisdom." In studies by Holliday and Chandler (1986), Brent and Watson (1980) and Clayton and Birren (1980), respondents generated descriptors that were similar to those generated by respondents in the present study. Each of these studies also produced, through either principal components analysis or multidimensional scaling, a result that is comparable to the present findings, thus adding to content validity. The Holliday and Chandler (1986) study are especially pertinent because they used Habermas's theory of knowledge-constitutive interests to account for their findings.

Criterion related validity was garnered in phase 2 and phase 3 of the data analysis. Although no actual measure of relationship was attained between the results of phase 1 with the results of phase 2 and 3 the researcher attempted to determine if the pattern of results found

in phase 1 would be verified by the pattern of results found in phase 2 and 3. This seems to be the case. In phase 1 technical, practical, and emancipatory knowledge were found to comprise wisdom in teaching. In phase 2, only teachers believed to be closer to the prototype of wisdom (department heads) demonstrated all three ways of knowing in response to questions of educational significance. Finally, in phase 3 one teacher believed to be prototypically wise displayed technical, practical, and emancipatory knowing in her teaching. Criterion validity was attained for the empirical model through the comparison to what prototypically wise teachers do in practice.

Construct validity is more difficult to assess. The construct I wish to acquire evidence for is "wisdom in teaching." A number of researchers (e.g., Baltes & Smith, 1990; Brent & Watson, 1980; Chandler & Holliday, 1990; Clayton & Birren, 1980; Orwell & Perlmutter, 1990; Sternberg, 1990) have found evidence that there may be common notion of wisdom. While other researchers (Lee, 1993; Greene, 1988; Schon, 1983; Arlin, 1993) have found evidence for different conceptions of wisdom in teaching. Therefore, evidence for a construct of wisdom has been established with at least two different research approaches. In the present work much of what these previous researchers have found has been emulated, and much is new.

4. DESCRIPTIVE STATISTICS

Table 2 displays the age and gender characteristics of phase one participants.

Table 2

Age characteristics of phase 1 participants
(step 1 & 2)

	MEAN	RANGE	STANDARD DEVIATION
<i>Step 1: Wise</i>			
Males (n=17)	28.56	23-43	8.49
Females (n=13)	26.33	22-35	6.43
<i>Step 1: Expert</i>			
Males (n=16)	27.98	24-45	7.77
Females (n=14)	26.25	21-33	5.65
<i>Step 2: Wise</i>			
Males (n=35)	27.39	23-38	6.94
Females (n=25)	25.83	22-33	4.43
<i>Step 2: Expert</i>			
Males (n=22)	27.37	23-42	10.07
Females (n=16)	25.65	21-34	6.63

Simple descriptive statistics were also collected using SPSSX to appraise the central tendency and variability of scaled items.

Table 3

Descriptive statistics for the wise and expert
scales

	<u>WISE</u>	<u>EXPERT</u>
DESCRIPTORS	MEAN-SD	MEAN-SD
APPROACHABLE	7.58-2.32	7.66-1.65
CARING	7.62-2.10	7.76-1.53
CREATIVE	7.00-1.98	7.61-1.70
ENTHUSIASTIC	7.63-2.35	8.26-1.45
FAIR	8.08-1.68	8.42-1.59
HAS EXPERIENCE	7.33-2.52	8.97-1.00
INTELLIGENT	7.75-1.82	8.74-1.22
INTERESTED, INVOLVED	8.15-1.72	7.74-1.69
OPEN-MINDED	8.08-1.78	8.13-1.49
PATIENT	7.62-2.04	8.00-1.49
REFLECTIVE	7.77-1.50	7.47-2.31
SENSE OF HUMOUR	6.18-2.11	6.82-1.96
THOROUGH KNOWLEDGE	7.68-2.16	9.11-1.09
UNDERSTANDING	7.70-1.91	7.29-1.75
WITH-IT, STREET-SMART	7.27-1.86	6.66-2.02
ACCOUNTABLE	7.80-1.71	
CALM	6.62-2.22	
CLASSROOM AWARENESS	8.65-1.02	
COMMUNICATES CLEARLY		8.21-2.15
CONSISTENT, RELIABLE		7.76-1.50
DEDICATED, COMMITTED		8.24-1.53
DISCIPLINED CLASSROOM		8.21-1.61
ENCOURAGING		7.76-1.76
GENEROUS	5.50-2.33	
INDIVIDUAL DIFFERENCES	8.37-1.44	
INTERESTING		8.32-1.54
MAKES SOUND DECISIONS	7.97-1.51	
ORGANIZED, PREPARED	8.53-1.20	
PROFESSIONAL, PROFICIENT		8.47-0.95
TEACHING RELATES	8.42-1.28	
THOUGHT PROVOKING	7.98-1.86	
WILLING TO CHANGE		8.37-1.62

Results

Considering that subjects were specifically requested to use the whole of the 11 (0-10) point scale developed for this study, what might be noticed first in Table 3 is the seemingly high overall ratings of descriptors (mean=7.83, sd=1.64). Respondents generally thought that these descriptors were typical of "wise" or "expert" teachers. The "expertise" scale produced a mean prototypicality rating of 8.04 (sd=1.61) while the "wisdom" scale produced a mean of 7.62 (sd=1.67). Descriptors on the "expertise" scale ranged from a high of 9.11 for "thorough knowledge of subject area" to a low of 6.66 for "with-it, street-smart." The highest prototypicality on the "wisdom" scale was achieved by "observant, classroom awareness" (mean=8.65, sd=1.02) and the lowest rating was a mean of 5.50 (sd=2.33) for "generous." Of the 47 descriptors used on both scales 20 (42.5%) had a mean rating of eight or higher.

Although further analyses detected some statistical differences among these means it is important to reemphasize their overall magnitude. The relatively large means and small standard deviations indicate the respondents were consistent in their beliefs that these were generally typical descriptors of "wise" or "expert" teachers. As noted in the previous step of the analysis, the descriptors used in the "expertise" and "wisdom" scales were the most frequently occurring descriptors from the first step of this phase. Therefore, it seems reasonable that they might receive high ratings in this second step.

5. RELATIONSHIP BETWEEN STEP 1 AND STEP 2 RATINGS

Following Holliday and Chandler (1986), the researcher assessed whether the frequency of the prototype ratings for the "wise" and "expert" descriptors in step 1 were a function of the magnitude that these same descriptors were endorsed in step 2. A Pearson product moment correlation was computed for both "wise" $r=0.24$ ($p=.13$) and "expert" samples $r=0.20$ ($p=.18$). A point biserial correlation was also computed for both samples with those descriptors having a frequency of less than 10 recoded as "1" and those with a frequency of 10 or more recoded as "2." Generally, the results were slightly higher: "wise" $r=0.32$ ($p=.07$), "expert" $r=0.28$ ($p=.10$). Correlations by both methods are indicative of marginal relationships between the frequency that a descriptor was initially endorsed and subsequent prototypicality ratings. A result of this nature was expected because there should be at least a perfunctory relationship between the frequency that one group of participants endorses certain descriptors of wisdom and expertise and the magnitude that another group of participants rates these same descriptors. If anything, a stronger relationship may have been expected. The correlations, however, were computed on the 23 most frequent descriptors of expertise, and the 24 most frequent descriptors of wisdom (i.e., only those descriptors that were stated at least five times). Perhaps because of this, participants generally considered all these high frequency descriptors typical of wisdom and expertise in teaching. Therefore, within this subset of descriptors there was little room for a

correlational pattern to develop, i.e., there may have been a ceiling effect.

6. PRINCIPAL COMPONENTS ANALYSIS: WISDOM SCALE

In the most crucial aspect of the phase I analysis a principal components analysis using a varimax criterion was conducted on the prototypicality ratings collected on the wisdom and expertise scales. From the prototypicality ratings the researcher hoped to assess the underlying structure of both the "wisdom" and "expertise" scales for the purpose of understanding the essence of exceptional teaching.

Table 4

Rotated components for wisdom				
COMPONENT	LOADING	*X-LOADING	EIGEN.	VAR.
<u>COMPONENT 1</u>			7.47	31.1
APPROACHABLE	.88	.23		
ENTHUSIASTIC	.82	.30		
PATIENT	.79	.32		
UNDERSTANDING	.78	.24		
CARING	.75	.38		
HUMOUR	.72	.20		
CALM	.68	.41		
FAIR	.55	.41		
GENEROUS	.50	.43		
INTERESTED	.48	.48		
<u>COMPONENT 2</u>			3.38	14.1
EXPERIENCE	.87	.11		
THOROUGH KNOWLEDGE	.82	.21		
INTELLIGENT	.80	.14		
SOUND DECISIONS	.64	.36		
THOUGHT PROVOKING	.64	.31		
<u>COMPONENT 3</u>			1.82	7.6
OPEN-MINDED	.77	.26		
CREATIVE	.76	.31		
REFLECTIVE	.55	.35		
<u>COMPONENT 4</u>			1.44	6.0
CLASSROOM AWARENESS	.76	.29		
ORGANIZED, PREPARED	.69	.11		
<u>COMPONENT 5</u>			1.31	5.5
TEACHING RELATES TO	.72	.34		
STUDENT EXPERIENCES				
RECOGNIZES INDIVIDUAL	.42	.39		
DIFFERENCES				
ACCOUNTABLE	-.41	-.16		
<u>COMPONENT 6</u>			1.09	4.6
WITH-IT, STREET-SMART	.82	.17		
ACCUMULATED VARIANCE				68.8
*highest loading on any other component				

Results

The results of the principal components analysis on the wisdom scale were very encouraging (see the full correlation matrix and component loading matrix in Appendix C). The analysis produced six orthogonal components explaining 68.8 percent of what it means to be a "wise" teacher. Considering the relatively small number of descriptors used in this analysis⁵ compared with typical principal components analyses a component structure of this nature seems noteworthy.

A principal component structure, however, is only "noteworthy" if it is interpretable. This seems to be the case with the present analysis. The first component is composed of descriptors that describe the wise teacher as: *approachable, enthusiastic, patient, empathetic, caring, calm, fair, generous, and interested*. This latent component consists of descriptors that all seem to be illustrative of a practical way of knowing described in Chapter 1. This component accounts for a substantial 31.1 percent of the variance with regards to what constitutes "wise" teaching. The second component accounts for 14.1 percent of the variance and is composed of: *experienced (experience with subject area), thorough knowledge of subject area, intelligent (generally knowledgeable), makes sound decisions, and thought provoking*. These descriptors seem to correspond to Habermas's technical knowledge-constitutive interest. The third component, composed of: *open-minded,*

⁵ For example, Holliday and Chandler (1986) employed 79 descriptors in their principal components analysis and accounted for 41 percent of the variance.

Results

creative, and reflective accounted for 7.6 percent of the variance and seems to represent an emancipatory way of knowing.

The final three components could not be interpreted in terms of Habermas's theory of knowledge-constitutive interests. The fourth component consists of two descriptors: *classroom awareness* and *organized, prepared*. Tabachnick and Fidell (1989; p. 636) recommend that when two descriptors form a component they should correlate at least .70 with each other while being uncorrelated with the other descriptors. This was not the case in this analysis, *classroom awareness* and *organized, prepared* correlated only .33 with each other and correlated very close and sometimes higher than this with a number of other descriptors. Tabachnick and Fidell suggest that components composed of two descriptors are often unreliable even when the aforementioned statistical criteria is met. Caution should also be taken when interpreting the sixth component because it is composed of a solitary descriptor (*with-it, street-smart*), thus it too, is unreliable in Tabachnick and Fidell's (1989) terms.

Finally, component five consists of three descriptors (*teaching relates to student experiences, recognizes individual differences, and, accountable*) that seem on the surface, to be an aspect of practical knowing. But the tenuous nature of this component is revealed when another statistical standard is applied. Specifically, the researcher determined (see Tabachnick & Fidell, 1989; Holliday & Chandler, 1986) that in order to be considered for membership in component categories

the following statistical standard must be upheld. The standard was to have a loading of at least .50 with a "home" component, while at the same time exhibiting a component loading of least .20 less with any other component. When this criterion is employed component five is reduced to one descriptor (teaching relates to student experiences), and thus it too must be considered unreliable.

Table 5 displays the final interpretable components for the wisdom prototypicality scale.

Table 5

Rotated final components for wisdom

COMPONENTS	LOADING	*X-LOADING	DIFFERENCE
<u>"PRACTICAL"</u>			
APPROACHABLE	.88	.23	.65
ENTHUSIASTIC	.82	.30	.52
PATIENT	.79	.32	.47
UNDERSTANDING	.78	.24	.54
CARING	.75	.38	.37
HUMOUR	.72	.20	.52
<u>"TECHNICAL"</u>			
EXPERIENCE	.87	.11	.76
THOROUGH KNOWLEDGE	.82	.21	.61
INTELLIGENT	.80	.14	.66
SOUND DECISIONS	.64	.36	.28
THOUGHT PROVOKING	.64	.31	.33
<u>"EMANCIPATORY"</u>			
OPEN-MINDED	.77	.26	.51
CREATIVE	.76	.31	.45
REFLECTIVE	.55	.35	.20
ACCUMULATED VARIANCE			52.8
*highest loading on any other component			

Results

As an indication of the strength of loadings on the home component versus the highest loadings on any other components, mean loadings were calculated. For "Practical" the "home" loading mean was .79, and the "away" loading was .28. This means that there was an average difference of .51 between the "home" and "away" loadings. For "Technical" the "home" loading mean was .75, and the "away" mean was .23, indicating an average difference of .52. Finally, for "Emancipatory" the "home" loading mean was .69, and the "away" mean was .31, indicating a mean difference of .38. Overall, the difference between "home" and "away" component loadings was .45. This sizable difference between loadings seems to suggest a strong component structure.

An ideal result for the present would be if each descriptor from the initial data loaded on either the technical, practical, or emancipatory component. That did not happen in the present study. Of the 24 original descriptors that were entered into the principal components analysis 14 (58%) appeared in the final rotated components for wisdom in teaching. That is, 14 out of 24 descriptors were both interpretable, in that they provided evidence of the hypothesized empirical model of exceptional teaching, and they met a predetermined statistical criteria. The 10 descriptors that did not load on the first three components did not form any substantive components of their own that could have added to the interpretation of the present findings. Together the last three components accounted for 16 percent of the variance while the first three components accounted for 52.8 percent of the variance.

Considering that the entire analysis in phase 1 is based on prototype conceptions of exceptional teaching one might expect that if a similar group of respondents were given the same 24 descriptors to rate, these descriptors would not fall into exactly the same component structures. One might expect, however, that there would be a certain consistency with regards to the three interpretable components found in the present study. That is, although exactly the same descriptors may not load on the technical, practical, and emancipatory components⁶ found in the present study there should be consistency with regards to finding technical, practical, and emancipatory knowledge.

In hypothesis 1a it was predicted that descriptors of wise teaching will group together to form three orthogonal constructs: (a) technical, (b) practical, and, (c) emancipatory, and each of these constructs was expected to account for a modest proportion of variance that explains exceptional teaching. It seems as if this hypothesis is tenable, therefore, an adequate model for wisdom in teaching is apparent.

6 A different set of descriptors would be initially generated by respondents, but these descriptors would be just as likely to follow the pattern of results that the descriptors in the present study followed. That is, to load on three orthogonal dimensions related to technical, practical and emancipatory knowing.

7. PRINCIPAL COMPONENTS ANALYSIS: EXPERTISE SCALE

The descriptors that composed the expertise in teaching rating scale were put through the same statistical procedure as the wisdom scale variables.

Table 6

Rotated components for expertise

COMPONENTS	LOADING	*X-LOADING	EIGEN.	VAR.
<u>COMPONENT 1</u>			9.32	41.8
EXPERIENCE	.85	.17		
PROFESSIONAL	.81	.13		
DEDICATED	.80	.20		
INTELLIGENT	.79	.34		
THOROUGH KNOWLEDGE	.62	.09		
<u>COMPONENT 2</u>			2.27	9.9
APPROACHABLE	.70	.38		
CONSISTENT	.61	.33		
ENTHUSIASTIC	.61	.48		
ENCOURAGING	.58	.40		
CARING	.58	.51		
PATIENT	.49	.45		
EMPATHY	.49	.45		
<u>COMPONENT 3</u>			1.98	8.6
SENSE OF HUMOUR	.87	.19		
FAIR	.61	.43		
REFLECTIVE	.57	.51		
<u>COMPONENT 4</u>			1.68	7.3
WILLING TO EVOLVE	.88	.15		
INTERESTED	.76	.58		
<u>COMPONENT 5</u>			1.40	6.1
DISCIPLINED	.84	.24		
CLASSROOM MANAGER				
<u>COMPONENT 6</u>			1.26	5.5
CREATIVE	.65	.40		
<u>COMPONENT 7</u>			1.12	4.9
COMMUNICATES CLEARLY	-.87	-.07		
WITH-IT	.56	.31		
<u>COMPONENT 8</u>			1.02	4.4
OPEN-MINDED	.87	.20		
ACCUMULATED VARIANCE				78.8

*highest loading on any other component

Results

The results of the principal components analysis on the expert scale are also very encouraging (see the full correlation matrix and component loading matrix in Appendix C). The analysis produced eight orthogonal components explaining 78.8 percent of what it means to be an "expert" teacher. Again, considering the relatively small number of descriptors used in this analysis compared with typical principal components analyses (e.g., Holliday & Chandler, 1986) a component structure of this nature may be noteworthy.

The first component is formed from descriptors that depict the expert teacher as: *experienced, professional, dedicated, intelligent, and thoroughly knowledgeable* about a given subject area. These descriptors seem to represent Habermas's technical way of knowing. This component accounts for 41.8 percent of the variance with regards to what constitutes "expert" teaching. No descriptors were dropped from this component when statistical criteria were applied.

The second component accounts for 9.9 percent of the variance and is composed of: *approachable, consistent, enthusiastic, encouraging, caring, patient, and empathy*. These descriptors seem to represent a practical way of knowing. When the statistical criteria is applied, however, only two descriptors (*approachable, consistent*) remain viable. Although these two descriptors seem to be related to practical knowing the fact that only two pass the statistical criteria certainly dampens any interpretation.

Results

Tabachnick and Fidell's (1989; p. 636) recommendation with regards to the reliability of a component when only two descriptors account for it may be employed to clarify the interpretation. The correlation between *approachable* and *consistent* is .53 (below the .70 recommended) and each of these two descriptors is positively correlated with a number of other descriptors. Tabachnick and Fidell suggest that components composed of two descriptors are often unreliable (especially when certain statistical criteria are not met) and any interpretation of such components is cautious at best. Therefore, the reader should keep in mind that I interpret this second component as evidence for practical knowing with great caution.

The third component accounts for 8.6 percent of the variance and is composed of *sense of humour*, *fair* and *reflective*. When the statistical criteria (home loading $>.50$ and highest away loading at least .20 less) is applied, *fair* and *reflective* are dropped, thus leaving a unreliable component made up of one descriptor (*sense of humour*).

Each of the last five components (4-8) are also unreliable because they either are composed of one descriptor to begin with or are reduced to one descriptor after the statistical criteria are applied. Together the uninterpretable components accounted for 27.1 percent of the variance while the interpretable components accounted for 51.7 percent of the variance. Table 7 displays the final components.

Table 7

Rotated final components for expertise			
COMPONENTS	LOADING	*X-LOADING	DIFFERENCE
<u>TECHNICAL</u>			
EXPERIENCED	.85	.17	.68
PROFESSIONAL	.81	.13	.68
DEDICATED	.80	.20	.60
INTELLIGENT	.79	.34	.45
THOROUGH KNOWLEDGE	.62	.09	.53
<u>PRACTICAL</u>			
APPROACHABLE	.70	.38	.32
CONSISTENT	.61	.33	.28
ACCUMULATED VARIANCE			51.7

*highest loading on any other component

Like the wisdom scale, an indication of the strength of loadings on the home component versus the away components was calculated. For "technical" the "home" loading mean was .77, and the "away" loading mean was .19, which means that there was an average difference of .58 between the "home" and "away" loadings. For "practical" the "home" loading mean was .66, and the "away" mean was .35, indicating an average difference of .29. Overall, the difference between "home" and "away" component loadings was .51.

In hypothesis IIa it was predicted that descriptors of expert teaching will group together to form two orthogonal constructs: (a) technical, and (b) practical. Both of these constructs were expected to account for a significant proportion of variance that would explain exceptional teaching. We can see from Table 7 that after the "home" and "away" criterion is applied that, we have two components that correspond to Habermas' knowledge-constitutive interests; a strong "technical" component and weak "practical" component. We can also see that there is no component that can be labeled emancipatory as with the wisdom scale.

8. COMPARISON OF THE WISDOM AND EXPERTISE SCALES

To clarify the patterns of overlap between "wise" and "expert" teachers further analyses were performed. In table 8 the attributes of the components that formed the latent structure of the "wise" and "expert" teacher ratings were recorded along with an indication of whether those attributes were associated with the other scale.

Table 8

Overlap between descriptors that formed
interpretable components

ALL DESCRIPTORS	EXPERTISE	WISDOM
APPROACHABLE	X	X
CARING	-	X
CONSISTENT	X	-
CREATIVE	-	X
DEDICATED	X	-
ENTHUSIASTIC	-	X
HAS EXPERIENCE	X	X
INTELLIGENT	X	X
INTERESTED	-	-
OPEN-MINDED	-	X
PATIENT	-	X
REFLECT	-	X
SENSE OF HUMOUR	-	X
SOUND DECISIONS	X	-
THOROUGH KNOWLEDGE	X	X
THOUGHT PROVOKING	X	-
UNDERSTANDING	-	X
WILLING TO EVOLVE	-	-

X=descriptor loaded on an interpretable component

-=descriptor did not load on an interpretable component

Out of 18 descriptors that formed part of the interpretable components on the wisdom and expertise scales four (22%) loaded on both, eight (44%) loaded on wisdom only, and four (22%) loaded on expertise. Two descriptors (11%) did not load on any interpretable component. This result confirms the previously noted fact that the constructs of wisdom and expertise are moderately related.

Interpretation of the principal components analysis, however, went beyond the latent structures of wisdom and expertise in teaching. Holliday and Chandler (1986), emphasize that when performing analyses based on prototypicality ratings the researcher must recognize the influence of highly prototypical items within each component. A smaller number of highly prototypical items will be assumed to be reflective of a stronger component structure than a larger number of less prototypical items. To this end, the mean prototypicality rating for the technical, practical, and emancipatory components on the wisdom scale and the technical, practical components from the expertise scale were computed. With these mean ratings comparisons were made within and across scales.

The first comparison was based on hypothesis Ib, which stated the following: one-tailed *dependent samples t-tests*⁷ will reveal that mean

⁷ *t*-tests were the analysis of choice at this particular stage because the purpose was to follow-up the principal components analysis with a comparison of means (as opposed to variance). The question of increasing the experiment-wise error rate beyond $p < .05$ when using a number *t*-tests is not an issue because *a priori* hypotheses (Ib, IIb and III) were made. When *a priori* hypotheses are made the researcher specifies the means that will differ (and in what direction) beforehand, thus eliminating the possibility that he is capitalizing on chance

Results

ratings for the descriptors that compose emancipatory knowledge on the wisdom scale will be statistically higher ($P < .05$) than the mean rating for the descriptors that compose technical knowing and practical knowing on this same scale. There will be no statistical difference between the mean ratings of technical and practical knowledge components.

This was not the case (see Table 9). Indeed, the "wise" teacher seems, rather, to have a balance of the three forms of knowledge.

findings related to putting a large number of comparisons into a post-hoc set of comparisons (Glass and Hopkins, 1984).

Table 9

t-tests among components on the wisdom scale

COMPONENTS	MEAN	DF	SD	T-VALUE	PROB.
PRACTICAL VS TECHNICAL	7.39 7.74	59	1.79 1.55	-1.20	0.24
PRACTICAL VS EMANCIPATORY	7.39 7.62	59	1.79 1.39	-1.04	0.30
TECHNICAL VS EMANCIPATORY	7.74 7.62	59	1.55 1.39	0.49	0.63

Results

In hypothesis IIb it was predicted that a one-tailed *dependent samples t-test* will reveal that mean ratings for the descriptors that compose technical knowing on the expertise scale will be statistically higher ($P < .05$) than mean ratings for the descriptors that compose practical knowing. The same hypothesis will apply if an emancipatory component is found. The comparison displayed in Table 10 confirms this hypothesis. It seems as if technical ways of knowing are most important to what it means to be an "expert" teacher.

Table 10

t-tests among components on the expert scale

COMPONENTS	MEAN	DF	SD	T-VALUE	PROB.
TECHNICAL	8.71		1.35		
VS		37		2.98	0.01
PRACTICAL	7.71		1.26		

Results

Final comparisons were made among constructs found with the "wisdom in teaching" rating scale (hypothesis I) versus constructs found with the expertise in teaching rating scale (hypothesis II). One-tailed *independent samples t-test* revealed the following results.

From Table 11 a mean rating for the descriptors that compose technical knowing on the "expertise scale" was statistically higher ($P < .05$) than the mean rating for the descriptors that compose technical knowing on the "wisdom scale." Thus indicating that technical knowledge seems to be a more important way of knowing for the "expert" teacher.

The final hypothesis that has not been dealt with directly is the following: a mean rating for the descriptors that compose emancipatory knowing on the "wisdom scale" will be statistically higher ($P < .05$) than the mean rating for the descriptors that compose emancipatory knowing on the "expertise scale". No emancipatory component was found on the expertise scale thus indicating that an emancipatory way of knowing does not seem to be an aspect of "expert" teaching. This finding seems even stronger than if a statistically significant difference was found between means.

Table 11

t-tests among components across the expertise
and wisdom scales

COMPONENTS	MEAN	DF	SD	T-VALUE	PROB.
TECHNICAL.E VS TECHNICAL.W	8.71 7.79	37	1.35 1.56	2.91	.01
TECHNICAL.E VS PRACTICAL.W	8.71 7.27	37	1.35 2.00	4.04	.001
TECHNICAL.E VS EMANCIPATORY.W	8.71 7.43	37	1.35 1.55	3.98	.001
PRACTICAL.E VS TECHNICAL.W	7.71 7.79	37	1.26 1.56	.41	.68
PRACTICAL.E VS PRACTICAL.W	7.71 7.27	37	1.26 2.00	1.33	.21
PRACTICAL.E VS EMANCIPATORY.W	7.71 7.43	37	1.26 1.55	.83	.35

C. PHASE 2 FINDINGS

In hypothesis IV it was predicted that the deft reconciliation of two educationally relevant questions will distinguish those assumed to be closer to the prototype conception of wisdom from those who are not.

The questions are repeated for convenience:

1. *What is your definition of teaching and the best ways that teachers teach?*
2. *What is your definition of learning and the best ways that students learn?*

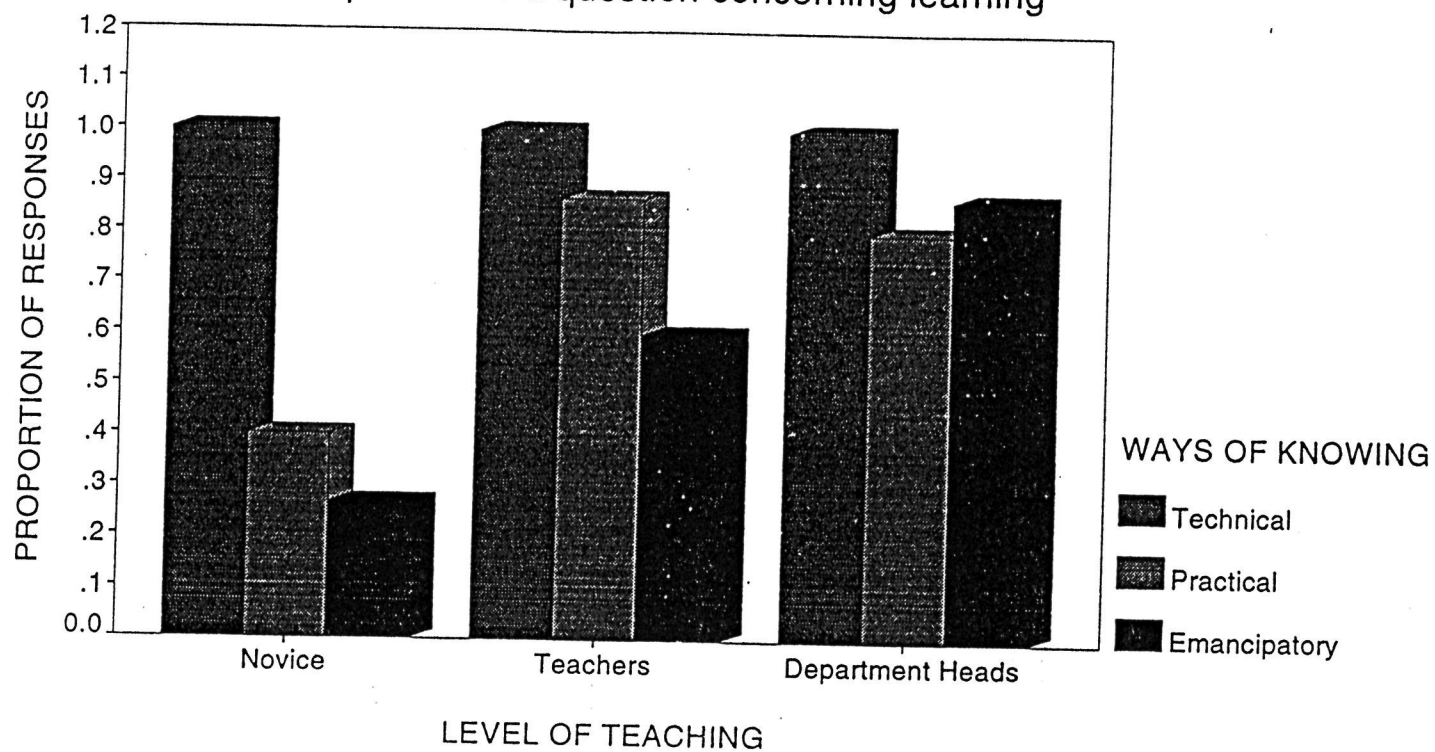
Chi-Square analyses were run to determine if the frequency with which the three groups' responses differ in a statistically significant way. When a respondent showed any evidence of technical, practical, or emancipatory knowing they were credited with thinking in that way. The important point is that Habermas's ways of thinking are present or not i.e., the coding was binary. For each question, a comparison of three independent Chi-Squares were computed to compare use of technical, practical, and emancipatory knowledge across respondents. For each question, the use of technical, practical, and emancipatory knowledge was made within respondents. Therefore, a total of six Chi-Squares were computed on each question.

The findings of phase 2 support the hypothesis. Department heads, considered closer to the prototype of a "wise" teacher, exhibited a

Results

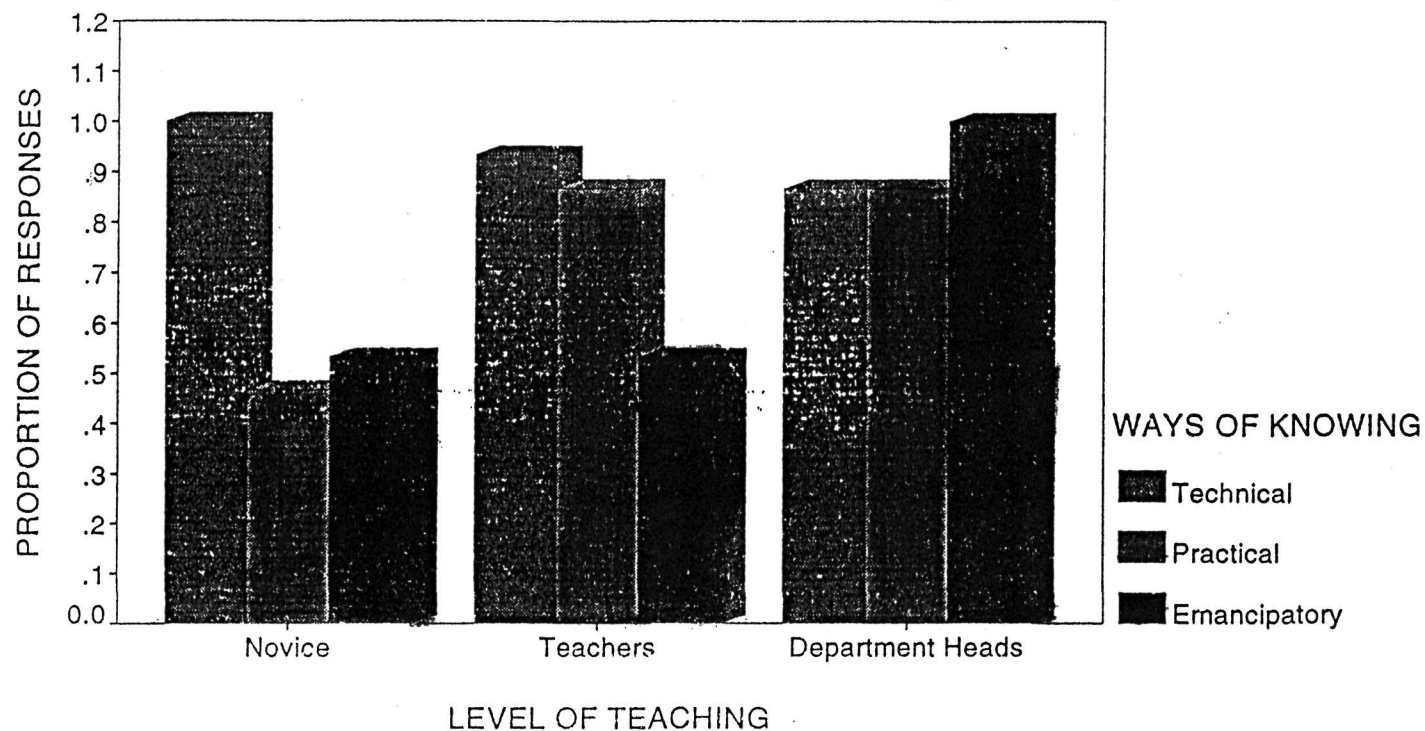
greater variety and number of responses associated with the three components of wisdom than teachers and students teachers. The following figures were produced based on the content analysis of the phase 2 data.

Fig. 4 Ways of knowing as evidenced in three levels of teachers' responses to a question concerning learning



142

Fig. 5 Ways of knowing as evidenced in three levels of teachers' responses to a question concerning teaching



Results

Chi-Square analyses were run on the frequency data displayed in the figures. For both figures Chi-Squares were computed to compare the use of each form of knowledge across and within groups of respondents. In Figure 4, for example, a *Chi-Square* = 18.54(2), $p < .0001$, was computed for the Novice group. This statistically significant value indicates that there was a difference among the frequencies with which this group of respondents utilized Habermas's three knowledge forms to answer the question about the ways in which students learn best. (*What is your definition of learning? What is your view of the best ways that pupils learn?*) Only 4 of these 15 respondents demonstrated any form of emancipatory knowledge in their response, while all the respondents (100%) demonstrated technical knowledge. A typical response from one of these respondents was the following:

Learning is the ability to problem solve (Technical). Learning is also understanding the hows and whys (Technical). The best ways that students learn is hands-on/student directed activities (Technical). Less memorizing. More students find the answers themselves.

Although this respondent does indeed have something important to say about the nature of learning, only technical knowledge is evident from this response. There is no evidence of practical or emancipatory knowledge in this excerpt. When we compare this excerpt with one taken from the sample of department heads we will notice how the latter respondent utilizes all three forms of knowledge in a relatively short excerpt. This person said that students learn best by:

...discovering things (Technical); practicing new behaviours in a variety of ways (Technical); sharing ideas with others (Practical); trying new things and taking in new information (Technical); then, reflecting on it to reconstruct or reaffirm existing beliefs (Emancipatory).

In this excerpt, the respondent displays evidence for all three of Habermas's knowledge-constitutive interests.

With the "teachers" sample there is also a significant difference ($Chi-Square=8.51(2)$, $p=.014$) among the frequency of responses related to technical, practical, and emancipatory knowing. As with novice teachers, significantly fewer respondents showed evidence of emancipatory knowing as compared to technical and practical knowing.

With the department heads there was no significant variation among the way that they utilized technical, practical, and emancipatory knowledge. That is, only rarely was a response from a department head devoid of either technical, practical, or emancipatory knowledge.

The exact same pattern of results occurs when we analyze the results to the second question. In this question respondents were asked about *their definition of teaching and the best way to teach*. The novices varied significantly ($Chi-Square=11.40(2)$, $p=.003$) with regards to use of the three ways of knowing. From Figure 5 it seems clear that these respondents showed a greater propensity for generating responses that implied a technical way of knowing.

With the sample of "teachers" a $Chi-Square=7.97(2)$, $p<.019$ indicates a difference in use of technical and practical knowledge, versus emancipatory knowledge. Finally, with the department heads, as

with the previous question, there was no difference among the three ways of knowing, all were thoroughly employed by the respondents.

Another array of Chi-Square analyses were run on the frequency data collected in phase 2 to shed further light on the pattern of responses. The extent that each way of knowing is present in each of the groups of respondents was assessed. For example, with the first question (Figure 4) we can compare respondents on their use of technical knowledge. We can see that 100 percent of the respondents in each group utilized a technical way of knowing in their answers to this question. Thus, there is no difference among the three groups of respondents in the way they utilized technical knowledge in their answers.

The story, however, changes when comparing practical knowledge across groups ($\text{Chi-Square}=10.60(2)$, $p=.005$). Comparing the percentages based on the frequency of responses it seems that the "teachers" group and the department heads utilize more practical knowledge in their response to this question. There is also a difference among groups when we compare emancipatory knowledge ($\text{Chi-Square}=11.11(2)$, $p=.004$). The difference stems from "teachers" using this form of knowledge more often than novices, and department heads using emancipatory knowledge more often than both novices and "teachers."

As with the previous question, there was no difference across the three groups with regards to exercising technical knowledge in their response to this question. But also similar to the previous question "teachers" and department heads utilized practical knowledge more often

Results

than novices ($\text{Chi-Square}=8.18(2)$, $p=.017$). And finally, department heads demonstrated more evidence of the use of emancipatory knowledge as compared with the other two groups in responding to this second question concerning the nature of teaching ($\text{Chi-Square}=10.16(2)$, $p=.006$).

Generally, the findings from this phase of the study indicate that novice teachers tend to rely more heavily on technical explanations for how students learn best and how teachers teach best. They are not as able as the other two groups to elicit practical and emancipatory knowledge forms in their responses to two general questions about education. The primary difference between "teachers" and department heads is that department heads utilize considerably more emancipatory knowledge in their responses to these questions, while still employing technical and practical ways of knowing. Thus, there is a difference in the way student teachers, teachers, and department heads know as reflected in their responses to two questions about education.

D. PHASE 3 FINDINGS

An extended observation of a teacher deemed to be highly typical of a "wise" teacher was undertaken. It was hypothesized that the underlying components of wisdom described in phase one may be evident in this teacher's practice.

The results in phase 3 were based on observations by a trained assistant. The following discussion highlights some of the ways that this teacher demonstrated technical, practical, and emancipatory ways of

knowing in her teaching practice. Each one of the specific aspects that the assistant was asked to comment on has come from the final rotated dimensions of the principal components analysis on wisdom in teaching. I will discuss how each of these aspects was present in this teacher's teaching. The assistant used the following observation form:

1. Comment on any of the following aspects that relate to this teacher's teaching: EXPERIENCE, THOROUGH KNOWLEDGE OF SUBJECT AREA, INTELLIGENCE, SOUND DECISION MAKING, AND THOUGHT PROVOKING. Use specific examples from the teaching you observe.
2. Describe this teacher's interactions with the students, and use the following descriptors to guide your observations: APPROACHABLE, ENTHUSIASTIC, PATIENT, UNDERSTANDING, CARING, AND HUMOROUS. Use specific examples from the teaching you observe.
3. Comment on the following aspects that relate to this teacher's teaching: OPEN-MINDED, CREATIVE, AND REFLECTIVE. Use specific examples from their teaching where possible.

All of the comments presented in the phase 3 analysis will be composed of direct quotations and paraphrases from the observation forms. In addition, what was written on the observation forms will be supported by comments elicited by the researcher in debriefing sessions with both the observer and the teacher. These debriefing sessions aided the researcher in getting a more precise idea of what was occurring in the classroom.

SECTION #1: TECHNICAL WAYS OF KNOWING RELATED TO TEACHING PRACTICE.

EXPERIENCE:

- *24 years of teaching experience.
- *currently an elementary school principal, as well as a teacher.

THOROUGH KNOWLEDGE OF SUBJECT AREA:

*she presents a completely integrated math curriculum: math strands are taught simultaneously throughout the year. She believes that students learn best if they are continuously re-exposed to important ideas throughout the year. For example, in this class students do not learn place value in September, decimals in October, and so on.

*there is constant exchange occurring with the students that requires the teacher to understand the ideas behind what she is teaching her students. She is always one-step ahead of her students' thinking and this is not an easy task because the type of assignments that are given are complicated even by adult standards. In addition, they often elicit several acceptable approaches to solving them from the students. Therefore, the teacher must have the knowledge to grasp where a given student is coming from in order to facilitate their thinking.

*states that math is all about recognizing patterns. For example, she stated, "math is a science of patterns, if you begin to see patterns you will be a good mathematician." Or, "mathematics is based on patterns, and mathematicians are lazy, so if we know patterns, its easier to find answers."

*ideas are emphasized throughout lessons. A seemingly insignificant example, is the following. Whenever, students state a number in class and use the word "and" they are immediately asked to think about how they could make their statement of the number more correct. For example, the number 1001 should be stated "one thousand one" not "one thousand and one." According to the teacher using "and" in a single number is incorrect precisely because it is a single number. Using "and" implies that there is two numbers "1000" and "1."

*thorough and diverse system of evaluation that includes tests, reviews, assignments, participation, neatness of work, and self-evaluation.

INTELLIGENCE:

*from the statements throughout the phase 3 analysis it should be clear that this individual is intelligent.

SOUND DECISION MAKING:

The following are examples of decisions made by the teacher that seemed to benefit class progress:

*utilized a strategy in which each of the students in the class have a "homework buddy." Each person is responsible for bringing any work that is assigned during class home to their buddy.

*presents students with an advance organizer before each class.

*prepares her lessons such that students do not have to spend time doing mindless copying. If there was a problem to do students were provided with material in which to do the problem.

*expects that if class time is misused that student "will owe the teacher" time at recess, lunch or after school.

*if students misbehave in class all it takes from her is a look and the students know that they need to go sit in her office (she is the principal).

*desks arranged in different ways on different days, according to what the class will be doing.

*organized and prepared: always had activities ready to go, thoroughly organized term binder separated into strands, prepares lessons plans, students pre-assigned to set-up classroom prior to class beginning e.g., student assigned to set-up overhead, students assigned to bring calculators from storage area.

THOUGHT PROVOKING:

Results

*seldom is there an emphasis on the right answer in this math class. The process of solving problems was honoured by the teacher. Students were told things like "you need to use your metacognitive skills, that means think about your thinking." Or, a student might state that, "I'm going to take a guess", and the teacher would respond with "that's good", thus encouraging students to take risks. Or, "before you guess, tell me what your thinking, how did get your answer." For example, in one session she asked the students "what's a polygon"? Students responded with answers. One student was then requested to come up to the overhead and explain (with examples) for the class what he thought a polygon was. According to Piaget (1948) the students are learning to be "autonomous" through the construction of their own meanings in the classroom.

*the teacher also modeled strategies to help the students solve problems such as "thinking aloud." For example, a student asked whether he should "put a cross on the words that he did not know." The teacher responded that "she did not like crosses" and she would rather have them use a "question mark." When I asked the teacher why she would rather have the students use a question mark she responded "the students know that with question marks there are still questions that need to be answered."

*in a "pre-test" the teacher gave the students about a dozen words that were going to be emphasized in upcoming lessons. Students commented a number of times that they did not know the meaning of these words. The teacher knew that the students had been exposed to these ideas (e.g., least common multiple, greatest common factor) before and responded to the students' with statements such as, "you really have never heard these words before" [maybe] you have heard them before, but are unsure of the meaning." Thus, prompting further thought in an area she believed the students knew more than they thought.

Results

*two activities that were described as thought provoking or engaging by the observer are as follows: The first is called Pico, Bagel, Fermi. It is a problem solving activity in which the students must determine a number that the teacher has chosen at random. The students have learned that a Pico is a "wrong number", therefore it is not part of the solution. They know that a Bagel is a "right number in the wrong spot" and a Fermi is a "right number in the right spot." The students are also given additional rules for each particular example, such as, "this example is a four digit number with no doubles." The students proceed by giving the teacher examples of numbers and after each number is given by the students the teacher tells them how many Picos, Bagels, and Fermis there are in that number. The students use deductive reasoning skills to determine the correct number.

*another activity requires the students to make their own mathematical equations using different number operations. The activity is referred to as "In/Out." The students are required to make-up their own equation using any two of the following number operations: adding, subtracting, multiplying, and dividing. The student stands in front of the class and presents one number (In) and then another number (Out). The process is repeated as many times as is necessary for the other students to determine what operations were performed (e.g., multiplied by five and then add two). This activity is essentially solving for X, i.e., algebra.

Discussing two activities does not do justice to what is going on this classroom because each and every day there are three or four of these types of activities occurring. Each of these activities has a different focus, and as the teacher moves through the term and the year she presents activities that relate to all the core areas of knowledge (strands).

SECTION #2: PRACTICAL WAYS OF KNOWING RELATED TO TEACHING PRACTICE.

APPROACHABLE

*in five observation sessions this teacher made 13 statements to the effect that whenever students needed help with whatever they were working on they can go see her. Whether it be recess, lunch, or after school.

*teacher shared with the class an example she got from a workshop she attended on assessment and responded to students in class who said, "I thought teachers just sat around and talked about students." She responded by saying, "is that what you really think teachers do?" This incident demonstrates that the teacher is approachable because the teacher is sharing a small part of her "other life" with the students and I think students respond to this by being more comfortable with the teacher.

ENTHUSIASTIC:

*there is a certain positive energy in this classroom that stems from the teacher. The nature of her personality is such that she is always making the students feel warm and welcome. She circulates throughout lessons working with students on the assignments and offering "praise and positive feedback."

*there is also an enthusiasm for learning that is obvious from talking with this teacher or viewing her classroom. The pleasure she gets from facilitating learning seems to be incorporated by the students into their own learning.

PATIENT:

*maintains her patience in management situations by not getting angry but by "calmly, yet firmly" telling the students what they need to do. There was a consistent pattern of dealing with discipline problems.

*patience is evident by the way that this teacher chooses to teach. She teaches for ideas that take time and are difficult for the students to understand initially. Therefore, patience is required so as to allow students to truly learn these ideas. But when the students do learn these ideas her patience is rewarded.

UNDERSTANDING:

*admits mistakes readily in classroom situations. She says things like, "oh well, teachers make mistakes too." Statements like this make students feel that the teacher understands when they make mistakes in class.

*the teacher's policy of "no criticisms" certainly shows that the teacher understands that some students can have a more difficult time in the classroom than others.

*if students have forgotten their math binder at home she will hold on to that student's work until the next math class.

CARING

*became an administrator because she wanted to help all students in her school learn better, not just the ones in her classroom. In the debriefing conversations with both the teacher and the observer it was stated "school is for the students." This caring attitude was readily evident in her teaching in that "all students were treated equally" in different classroom situations. For example, students made incorrect statements in class her response was consistent in that she would simply repeat the question.

*all students encouraged when it is their turn to speak, the teacher was firm about allowing each students their opportunity to speak in the classroom. She realizes a caring environment will prompt students to take the kind of intellectual risks she wants the students to take. Indeed, there is a classroom policy of "no criticisms." Statements such as, "does anyone want to tell me what they are thinking right now", would be made.

*while a student came to teacher's office to hand in work at lunch the teacher took the opportunity to tell this student "how pleased she with her progress."

*arranges a conference with each and every student to inform them of their first term mark. Why they got what they did, and how they can work on improving in the second term.

Results

*a simple incident from the classroom perhaps explains best how the teacher feels about the students in her classroom. This concerned a child's tendency to rock back and forth in his chair. I will use the observer's words: "she explained why leaning back in the chair is inappropriate, in a calm voice, and was persistent as the student made such responses as 'I don't care if I fall, it's fun.' Someone else said, 'it would not be fun if you became a quadriplegic.' The teacher responded, 'you'd regret it for the rest of your life and I'd regret not helping you.' The student responded, 'why would you regret it?' The teacher responded, 'because I care for you, I care for all human beings.'

SENSE OF HUMOUR:

*uses language appropriate for grade 7 students such as, "read my lips, homework is due on the date it is due". Said in a way that elicits laughter from the students.

A description of her strengths with regards to practical knowing go beyond the confines of the above categories. The teacher has a quality in which students immediately feel comfortable with. Although she demanded a lot from her students in the classroom, it was evident from the observations and debriefing sessions that the students enjoyed being in this class.

SECTION #3: EMANCIPATORY WAYS OF KNOWING RELATED TO TEACHING PRACTICE.

REFLECTIVE:

*continuously developing her own knowledge: she was taking two courses during the fall semester related to completing her M.A. in School Administration. She stated in the debriefing session she will pursue another M.A. in psychology in the near future. She has been an instructor for the Math: A Way of Thinking program for a number of years. She is truly a life-long learner.

Results

*decision was made on the spur of the moment in class to forgo a recommendation made in the curriculum guide regarding the structure of a unit because of observations made in the classroom on a particular day (i.e., she noticed that the students had a clear understanding of the concept she was about to teach).

*perhaps most important, she stated in the debriefing session that she does not feel that she is doing nearly enough with the students in her classroom. Perhaps it is this type of thinking that has allowed her to reach the level of teaching that she has.

OPEN-MINDED:

*a student in this class will never be told their thinking is "wrong." The teacher will always listen to students' responses to questions. She will ask students things like "do you still think that your answer is correct", or, "do you have a different idea now." If the students have changed their thinking they are invited to explain it to the class.

*accepts student suggestions with regards to the everyday running of the classroom. Students made a suggestion about how to organize their math binders and she thought it was a good idea.

CREATIVE:

*this is her own curriculum, developed by her, and for her. She has taken an incredible amount of resources and molded them into a powerful grade 7 math curriculum that presents ideas to students in an interesting and engaging way that promotes high level thinking at every turn.

*the resources for her math curriculum are tremendously varied, too many to mention and too varied to give an honest representation. Perhaps more important, she has adapted almost all of these sources of information to suit her style and needs in the classroom.

This is unlike most grade 7 math classes. The students are truly understanding what they are studying. It has been my experience that too often this is not the case. We should keep in mind that this is not a "gifted" class. Also, the students that comprise this class are the grade 7's from two separate grade 6/7 classes, neither of which is this

Results

teacher's home room. In addition, the actual classroom that this particular class is conducted is not the teachers. So there are certain inconveniences that this teacher has to deal with that other teachers take for granted. Despite the inconveniences this teacher runs a special classroom.

Thus, the results of phase 3 indicate that in a brief observation period, a teacher considered to be "wise" shows many of the important aspects hypothesized to underlie wisdom as described in phase 1 of the study. All three of Habermas's ways of knowing were evident in this teacher's practice.

V. DISCUSSION

A. SUMMARY OF RESULTS

Based on the results of the study, an empirical model of exceptional teaching is proposed. Truly exceptional teaching seems to be composed of three complementary ways of knowing, and the integration of these three ways of knowing may be best thought of as wisdom in teaching. Thus, Habermas's theory of knowledge-constitutive interests seems to provide the basis for an adequate empirical model of exceptional teaching, as it did for Holliday and Chandler (1986) in their study of wisdom in the general population.

This chapter is organized using the following structure. First, the empirical evidence for each of the three ways of knowing and how they seem to be important aspects of exceptional teaching will be summarized. Second, a discussion of how the present empirical model of exceptional teaching relates to previous theory will ensue. Third, possibilities for extending the present research will be explored.

B. DISCUSSION OF SPECIFIC FINDINGS

In this section the results of the study will be discussed as they pertain to Habermas's three ways of knowing. Important theoretical issues, noted in the chapter 1 and 2, will be fleshed out.

1. TECHNICAL

The rational, logical, and emotion-free knowledge, skills, and strategies of teaching (i.e., technical knowledge) seem to be an aspect of exceptional teaching, whether exceptional teaching is described as expertise or as wisdom. Therefore, research reviewed in Chapter 2 (e.g., Berliner et al., 1989; Shulman, 1987) that presents the exceptional teacher as a person who has accumulated a vast amount of technical or expert-like knowledge seems to be supported by the results in phase 1 of this study. We must keep in mind, however, that the expertise research has likely been extended by the present research because describing exceptional teaching solely as "expertise" results in the tendency to neglect other important aspects of exceptional teaching.

With this caution kept in mind, the phase 2 findings further demonstrate the importance of technical knowing for exceptional teaching. By far the most common responses to the two questions proposed in phase 2 were classified as pertaining to technical knowledge. Novice teachers, regular teachers and department heads all demonstrated a technical way of knowing more consistently than either a practical or emancipatory way of knowing.

Finally, in phase 3 of the analysis evidence of technical knowledge was present in the teaching practice of a teacher hypothesized to be wise. The most important overall implication of these findings is that, consistent with past research on expertise in teaching, technical ways of knowing seem important for exceptional teaching.

There seems to be a difference, however, between the importance of technical knowing for exceptional teaching described as expertise and exceptional teaching described as wisdom. In the phase 1 results it was found that for exceptional teaching described as wisdom a component that could be described as "technical" accounted for 14.1 percent of the variance. For exceptional teaching described as expertise a component described as expertise accounted for 41.8 percent of the variance. The strength of the relationship among the descriptors that compose the technical component on the expertise scale (as reflected by the percentage of variance accounted for) seems to be sizable compared with the strength of the relationship for descriptors that compose technical knowing on the wisdom scale. The strength of the technical component on the expertise scale is bolstered by the findings from Tables 10 and 11 that show mean comparisons between the technical components from the expertise scale and all other components from both scales. Each of the four comparisons demonstrate a statistically significant ($p < .01$) difference in favour of the technical knowing on the expertise scale. In short, technical knowing is a much more powerful component on the expertise scale. Indeed, it is the only reliable component on the expertise scale.

The most important implication of the difference between the two scales is that when people think of exceptional teaching as expertise they might primarily be referring to one way of knowing; a technical way of knowing. This conclusion seems to be consistent with the findings of

researchers who have described exceptional teaching as expertise. In Chapter 2 a number of studies were described (e.g., Berliner, 1986, 1989; Shulman, 1984, 1987) that described exceptional teaching as expertise and these researchers' descriptions of expertise seem to be similar to the present conception of technical knowing. This particular label for exceptional teaching was argued against throughout Chapter 2 because it was believed that such a description was incomplete in its depiction of truly exceptional teaching.

2. PRACTICAL

An understanding of idiosyncratic communication across individuals (i.e., practical knowledge) seems also to be an aspect of exceptional teaching described as expertise or wisdom. The classroom is a socially dynamic environment, in which social knowledge and social skills are important for exceptional teaching. There does, however, seem to be a difference between the importance of practical knowing for exceptional teaching described as expertise and exceptional teaching described as wisdom.

In phase 1 of the study it was found that a weak (only two descriptors in the final solution) practical dimension accounted for 9.9 percent of the variance explaining exceptional teaching as expertise. At the same time, 31.1 percent of the variance was explained by a practical dimension (7 descriptors) when exceptional teaching was described as wisdom. This result suggests that practical knowing is more important

for exceptional teaching described as wisdom than for exceptional teaching described as expertise.

The relationship between exceptional teaching described as wisdom and practical knowing is supported by the phase two findings. In phase 2, both practicing teachers and department heads responded more frequently than novices with responses that were based on practical knowledge. Assuming that regular practicing teachers, and especially department heads, are closer to the prototype of teachers who might be considered wise, it thus seems important that practical knowing distinguishes teachers assumed to be further from the prototype of a wise teachers (novice) from teachers closer to this prototype (regular practicing teachers and department heads). That is, practicing teachers, perhaps because they are closer to the prototype of a wise teacher, show evidence of greater practical knowledge. The results from phase 3 support this finding because a teacher hypothesized to be close to the prototype of a wise teacher displayed evidence of practical knowing in her teaching.

The importance of this finding may be bolstered if we remember the various research (e.g., Clark and Yinger, 1987; Goodlad, 1984; Kramer, 1990; Lee, 1993; Lickona, 1991; Prawat, 1992; Yinger and Hendricks-Lee, 1993) from Chapter 2 that supported the practical way of knowing as a vital aspect of exceptional teaching.

3. EMANCIPATORY

It seems as if "freeing oneself" from the bonds of either technical or practical knowledge (i.e., emancipatory knowledge) is also an aspect of exceptional teaching. Only, however, if that teaching is described as wisdom. In phase 1 of the study an emancipatory component for exceptional teaching was found only for the wisdom scale (three dimensions: open-minded, creative, reflective, accounted for 7.6 percent of the variance). No such component was found for the expertise scale; indicating that respondents did not rate emancipatory knowing as an aspect of expert teaching.

Second, in phase 2 of the study, emancipatory knowing distinguished the responses of a sample thought to be wise (department heads) from both a sample of regular teachers and a sample of student teachers. That is, a statistically greater number of department heads demonstrated evidence of emancipatory knowing in responses to two questions relevant to education. Therefore, emancipatory knowing seems, in some ways, to set the thinking of teachers considered closer to the prototype of a wise teacher (department heads) apart from those who are further away. The major implication of this finding seems to be that emancipatory knowing may be the distinguishing characteristic of exceptional teaching.

Further support for the finding that emancipatory knowing is an aspect of exceptional teaching comes from phase 3 of the analysis,

because emancipatory knowing was observed in the practice of a teacher hypothesized to be wise.

The important role of emancipatory knowing in exceptional teaching may not come as a surprise considering the work of Arlin (1990a), Clark, Clark, Fidler, and Underwood (1993), Dewey (1933, 1963, 1966), Egan (1986), Greene (1973, 1988), Lee (1993), Piaget (1948), Schon (1983), and, Yinger and Hendricks-Lee (1993), who, as discussed in Chapter 2, have all proposed similar ideas in their descriptions of exceptional teaching.¹

C. FITTING THE PRESENT NOTION OF EXCEPTIONAL TEACHING INTO A THEORETICAL PERSPECTIVE

Based on the above findings an attempt will be made to situate this study within a developmental context. I choose to situate this study within a developmental context because I suspect, based on the results of this study, that exceptional teachers have changed in some qualitative way from what they once were as teachers. Support for this particular inference is primarily drawn from the phase 2 results.

1 Some developmental researchers (e.g., Arlin, 1990b, Meacham, 1990) have referred to the structural change in thinking that leads to wisdom as postformal reasoning. It might be, however, that postformal reasoning is an aspect of emancipatory knowing, which in turn leads to wisdom in thought. If this is the case, then the special role of emancipatory knowing, as a higher level of thought necessary for the attainment of truly exceptional teaching, must be considered. Indeed, there is evidence from the results of this study that emancipatory knowing may be the sine qua non of wise teaching. It may distinguish the wise teacher from the expert teacher.

The results from phase 2 are especially relevant because level of teaching (novice, teacher, department head) was shown to be positively related to way of knowing (technical, practical, emancipatory). That is, as level of teaching moved closer to the prototype conception of a wise teacher (from novice to department head), way of knowing moved from technical to practical to emancipatory. As a result, emancipatory knowing was more closely associated with the way department heads' know their profession. In short, there seems to be a relationship between level of teaching and way of knowing, with emancipatory ways of knowing being associated with teachers closer to the prototype of a wise teacher.

Although I consider the growth into an exceptional teacher best described in a developmental context, the relationship some authors (e.g., Liben, 1989) have proposed between learning and development seems to be supported by the results of the study, as well. The relationship is that learning precedes development in individual human growth. From the results of the present study I would argue that, just as learning precedes development in general human growth (Liben, 1987), expertise is a necessary but not sufficient condition for the growth of wise teaching. Therefore, it might be that the culmination of learning is expertise, and the culmination of development is wisdom. Furthermore, becoming an expert teacher may be accomplished through learning, whereas, becoming a wise teacher may require development. If this argument is tenable then exceptional teaching should, therefore, be

considered within a developmental context, as opposed to the information processing context that some researchers (e.g., Berliner 1986; Shulman, 1987) have suggested.

Another implication of situating the present work within a developmental context is that it would extend previous work that supports life-span developmental theory (e.g., Arlin, 1993; Baltes, 1993). The results of this study (especially phase 2) support the inference that substantive growth is occurring throughout the career of the teacher. For example, if emancipatory knowledge develops in a teacher it is likely to occur after they have been teaching for a number of years. Thus, it seems that within the teaching profession substantive cognitive development persists well into mature adulthood.

D. FITTING THE PRESENT RESULTS INTO CONSTRUCTIVIST THEORY

To specify the place of the present results within developmental theory a comparison of the present model of exceptional teaching and constructivism can be made. The result of this comparison may demonstrate how the tenets of constructivism, as proposed by various authors, correspond with the essence of exceptional teaching as described in the present study. If the present results can be situated within constructivist theory then perhaps a theoretical base for the model of exceptional teaching proposed in this study could be established.

The primary basis for situating the present model of exceptional teaching specifically within constructivist theory is that there seems to be an emphasis in constructivist theory on notions similar to emancipatory knowledge. For example, Arlin (1993) and Lee (1993) both place an emphasis on the role of postformal reasoning for the attainment of truly exceptional teaching. Emancipatory knowledge, which I have previously argued holds much in common with postformal reasoning, has also been given special significance based on the results of the study. This is due to the role emancipatory knowledge seems to play in distinguishing wise teachers from their counterparts. Other conceptions of exceptional teaching (i.e., as expertise) do not seem to acknowledge the role of a way of thinking that is similar to postformal reasoning or emancipatory knowledge.

Other general findings that are common across constructivist views of teaching that also fit with the present description of an exceptional teacher include:

1. constructivist teachers seem to easily adapt to student differences because they have many ideas about the best ways that teachers teach and students learn;
2. constructivist teachers regard students as active accumulators of material, who do more than, listen, read, and perform prescribed activities;
3. constructivist teachers do more than impart knowledge.

With constructivism theory, teaching is described as a dynamic process where there is constant interaction between teacher and environment. Indeed, researchers, like Prawat (1992) believe that it is

important to move away from the traditional "transmission" approach to teaching, and "absorptionist" approach to learning. In order to inform educational progress, Prawat believes that teachers should strive to adopt a constructivist perspective; but admits it is difficult because such a perspective challenges many firmly established beliefs about teaching practice. As Duckworth, a proponent of the constructivist approach to teaching, writes: "the [exceptional] teacher has to be free to bring his or her entire capacity - *intellectual, academic, emotional, and interpersonal* - to bear on the job of teaching" (Meek, 1991; p. 34).

Teachers who are constructivists are also said to reflect on the relationship between teacher and student and their *conversations* (Arlin, 1990a; Lee, 1993; Yinger & Hendricks-Lee, 1993). Teachers engage students in *conversations* through which children's thinking is revealed. A partnership develops where teacher and student *negotiate shared meanings*. By asking students to think about *how they have* certain concepts teachers get a better picture of what students know. Constructivist teachers are not satisfied that students can restate a computational formula or algorithm. These teachers know that restatement does not mean *understanding*. Understanding rather than telling and retelling is the goal (Bransford, Sherwood and Sturdevent, 1987).

Constructivist teachers also remain open to answers and issues that are different from their own. They recognize the indeterminacy of knowledge. For example, sometimes when children seem to have a concept, further exploration reveals that these concepts are faulty in ways that

teachers would never have considered unless they had engaged the children in "conversations." Arlin (1990a) uses the term "wise" to refer to those teachers that adhere to constructivist ideals; so do I.

Based on constructivist theory, Yinger and Hendricks-Lee (1993) offer an "ecological conception of teaching" that corresponds to the present conception of exceptional teaching. They stress that in order to understand exceptional teaching we must realize that the nature of knowledge can only be understood within the realm of "integrated and holistic systems"; that knowledge can only be understood within the framework of our social world. We are social beings in a social world and even the most seemingly individual of cognitive tasks are grounded in the social environment. Therefore, trying to understand knowledge by focusing on individual cognitive processing is misguided, and hence traditional teaching, in which the emphasis is on isolated individual cognitive performance, is also misguided. The emphasis that wisdom scale respondents placed on practical knowledge seems to allow for similar deductions in the present study.

Even more similar, however, than Yinger and Hendricks-Lee to the findings in the present study, Lee (1993) recognizes that exceptional teaching is a simultaneously intellectual, emotional, and interpersonal process. Based on Scheffler (1985), Lee (1993) suggests, that three contexts should be considered when discussing exceptional teaching: (a) *the realm of knowledge*, (b) *the realm of imagination* (imagination,

creativity, and possibility) and, (c) *the realm of benevolent social processes* (an ethic of care and responsibility).

The symmetry between the present conception of exceptional teaching and Lee's conception is evident from a comparison between Lee's three "contexts" and Habermas's three "interests". When this comparison is made there seems to be a close correspondence among the components of wise teaching: Lee's realm of knowledge corresponds to Habermas's technical interest; Lee's realm of benevolent social processes corresponds to Habermas's practical interest; and, Lee's realm of imagination corresponds to Habermas's emancipatory interest.

Lee (1993) argues that wise teachers are likely to be postformal reasoners, at least within the context of the classroom. Moreover, some developmental theorists (e.g., Lee, 1993; Arlin, 1990) would suggest that postformal reasoning is necessary for the attainment of wisdom in teaching. I would add that postformal reasoning is not unlike the proposed conception of emancipatory knowing. Therefore, both postformal reasoning and emancipatory knowing play a similar role in describing wisdom in teaching. They both seem to be necessary for the attainment of wisdom in teaching. An interesting question for future research will be to sort out the relationship between these two ideas. For example, is one concept subordinate to the other?

In summary, the similarity between Lee's conception of wisdom in teaching and the present conception of wisdom in teaching seems to add some validity to the empirical model proposed in this study. This may be

especially so because Lee has developed her conception of teaching seemingly independent from any knowledge of Habermas's theory, yet the basic structure of both frameworks are remarkably similar. The present study does, however, add to Lee's constructivist perspective on exceptional teaching. Whereas, Lee has derived her conception of exceptional teaching from theoretical arguments, the present study is derived from empirical findings.

E. AN EMPIRICAL MODEL OF EXCEPTIONAL TEACHING: EXCEPTIONAL TEACHING AS WISDOM

Based on the results of the study an empirical model of teaching is proposed. At the heart of the model are three ways of knowing that together are necessary and sufficient conditions for the attainment of wisdom. The three phases of the results support the finding that exceptional teaching, described as wisdom, is the product of technical, practical and emancipatory knowing. Therefore, each of Habermas's ways of knowing are vital to an overall description of exceptional teaching. In so doing, previous research by Clayton and Birren (1982), and Holliday and Chandler (1986), which also found a three component structure to wisdom, has been verified. The difference between those studies and the present study is that they focused on wisdom in general, whereas, the focus of this study is specifically on wisdom in teaching.

To this end, the present model is proposed. It is a developmental model, situated in constructivist theory, that may be useful for

organizing research on the growth of teachers (see also Sprinthall, Reiman, and Thies-Sprinthall, 1993). With this empirical model, it is argued that technical and practical knowledge necessarily precedes the development of emancipatory knowledge, and emancipatory knowledge is necessary for the development of truly wise teaching. Therefore, in describing the growth of any particular teacher, they will first develop technical knowledge, almost simultaneously they will develop practical knowledge, and finally they might develop emancipatory knowledge. There is, however, different degrees to which teachers will develop each one of these ways of knowing. For example, I would argue that almost all teachers (even student teachers) have the ability to know in all three ways, including emancipatory. The key is the extent to which they can know. The full development of all three forms of knowledge, as indicated by the teacher in phase 3 of the study, is indicative of truly wise teaching.

The essence of what I am proposing is not new, indeed, I spent all of chapter 2 showing how previous research on exceptional teaching has embodied aspects of technical, practical, and emancipatory knowing. What I hope is new, however, is the framework or model of exceptional teaching that is being described. It is a framework that will hopefully, because of its relatively simple yet thorough structure, allow for extensive future research on the nature of exceptional teaching.

Based on the above framework, some tentative suggestions are made. First, relating to what teachers can do to improve their teaching

practice. The short answer is, recognize that good teaching is the result of technical, practical, and emancipatory knowing. The long answer is use technical, practical, and emancipatory knowing in their teaching practice for a sustained period of time.

Second, perhaps a greater emphasis should be placed on teaching for practical and emancipatory knowledge. For example, many researchers (e.g., Beach and Tedick, 1992) emphasize the importance of reflection for the development of teaching. Reflection can take many forms from journals, to interactions with colleagues. Perhaps a mentor program in which student teachers were placed in with a truly wise teacher would be effective. Lave (1988) writes that "apprentices learn to think, argue, act, and interact in increasingly knowledgeable ways with people who do something well, by doing it with them as legitimate, peripheral participants" (p.2). Based on Vygotsky (1978), Lave argues for the importance of social relations in the development of all forms of teacher knowledge. In Vygotskian terms the social plane becomes the psychological plane through the zone of proximal development. Thus, the apprentice/mentor relationship is an effective way of transferring knowledge.

Similarly, Shulman (1986) discusses the potential of using richly elaborated case studies, as they do in many legal and business programs, in teacher education programs. Students would study in detail typical, yet difficult, classroom situations.

Third, considering that development may play a crucial role in the growth of teachers it is probably advantageous for teachers to be exposed to as many ideas as possible related to development. Educating wise teachers must occur from the top down. Ammon and Hutchinson (1989) have reported on the Developmental Teacher Education Program at the University of California at Berkeley as one example. The goal of the program is to produce teachers who teach in ways that are consistent with developmental principles.

Perhaps Lee's (1993) description of a typical wise teacher's classroom integrates the ideas generated in the present empirical model best with what teachers might want to do in their classroom. Lee states that in practice wise teaching is *democratic*, *dialogic* and *ecologically valid*. Wise teaching is democratic because teachers and students are full partners in an educational community. The interactive and equitable nature of democratic teaching is said to be evident in cooperative models that stress mutual trust and respect, mutual helpfulness, freedom of expression, and acceptance of differences (Knowles, 1980). Wise teaching is described as *dialogic* because a disciplined dialogue occurs between teacher and student (See also Arlin [1990a] teaching as conversation). Disciplined dialogue manifests itself in the classroom in the form of dialogue journals, narratives, and story that "provide the perfect vehicle" to further the development emancipatory knowledge (Lee, 1993, p. 19). Finally, wise teaching, according to Lee, is *ecologically valid*. Ecologically valid teaching reflects the interconnectedness,

interdependency, and interrelatedness between the known and the knower; toward a nonfragmented knowledge of being and becoming. An ecologically valid classroom, therefore, is integrative and directed toward dynamic knowing. It is open to the possibility that facts and information may take on new meanings in the context of discursive interplay. The wise teacher's cognitive flexibility tempered by responsibility and self-reflection, results in mature action directed toward the common good.

In Chapter 2 a major assumption was made. It was noted that embedded in the discourse of our culture is a common conception of exceptional teaching. In interpreting the study and reviewing research such as Lee (1993) some evidence for this assumption has been acquired. With mounting evidence from this and other studies, perhaps there are certain definable aspects of exceptional teaching that teachers should strive towards. These definable aspects may be technical, practical and emancipatory knowing. It should be clear, however, that becoming a wise teacher is not nearly as straightforward as describing a wise teacher. At the very least the development of wise teaching, as it is described in this study, likely takes a number of years of classroom teaching. Nevertheless, I do think the ways of knowing (technical, practical, emancipatory) that provide the foundation for this model of teaching can be purposefully developed.

In summary, a model of exceptional teaching based on Habermas's theory has been suggested. Habermas's theory of knowledge-constitutive interests is a theory of how human beings can know their world. It is a

comprehensive theory that seems to account for the fundamental ways that we can know. Wisdom is an equally thorough construct. Wisdom takes into account: a) intelligence and knowledge, b) social adeptness and morality, and, c) a way of thinking that frees people from narrow views and biased perspectives. Wisdom may be the best description of ultimate human development and Habermas's theory may be the best account of wisdom. Perhaps the concept of wisdom has a special resonance in minds of people. Robinson (1990) notes that the notion of wisdom has a special place in the history of humankind. In addition, a number of researchers (e.g., Arlin, 1990; Baltes and Smith, 1984; Lee, 1994), both in and out of teaching, have recently proposed the benefits of looking at exceptional later life development as wisdom. This study adds to the mounting evidence backing wisdom as a viable concept for the study of exceptionality.

F. CONCLUSION

Grimmett and Erikson, 1988, p. 34) state that....

the successes of such individuals [i.e., exceptional teachers] tend to be born and to die; beneficial consequences extend only to those pupils who have personal contact with such teachers.... The only way that we can prevent such waste is by methods that enable us to make an analysis of what the teacher does intuitively, so that something accruing from this work can be communicated to others.

G. POSSIBILITIES FOR FUTURE RESEARCH

In terms of enhancing the present study a couple suggestions can be made. First, it would have been interesting to observe a novice and regular teacher in phase 3 as a comparison to the single wise teacher that was observed. Observing the other two levels of teachers would have solidified the results of phase 3.

Relatedly, if I were to observe teachers for the same purpose in the future I would extend the observation period, again for the purpose of placing the study on more solid theoretical ground. Indeed, in a perfect world longitudinal studies would be helpful in order to truly chart the development teaching practice.

Another suggestion is that future studies should validate the present formulation of wisdom in teaching against scales developed by other authors. For example, Teaching Dilemmas (Levitt, 1988), Life Planning Problems (Smith and Baltes, 1987), Cognitive Problem Finding (Arlin, 1990), Social Problem Finding, (Schwartz, 1977), Arlin Test for Formal Reasoning, (Arlin, 1986b), Reflective Judgment Interview (Kitchener et al., 1993), Dialectical Reasoning (Basseches, 1984) all could be used as a comparison base. It would be hoped that the wise teachers described in the present context could be confirmed as such by all of these measures, as well.

Another suggestion for future research may be to determine if the everyday conceptions of school-age children differ from the conceptions of adults. The argument could be made that if the point is to describe

exceptional teachers of children and adolescents then perhaps it may be important to ask what children and adolescents think exceptional teaching is. Indeed, it would be interesting to compare prototype conceptions by adults (as in the present study) with children's' conceptions. Earlier in the thesis I noted a pilot study in which grade 5 & 6 students' conceptions of both wise and expert teachers were studied. The general conclusion from this pilot study was that the students' conceptions of wise teaching formed into categories based on Habermas's theory, with the mean ratings for categories that related to practical knowing (kind, fair, etc.) being statistically higher than for any other category. Thus, indicating that these students felt strongly that descriptors related to practical knowing were the most important for "good" teachers to have.

Finally, a related topic for a future study might be comparing teachers at different grade levels for the extent to which they utilize Habermas's three ways of knowing. I would guess that there might be an overall difference between descriptions of elementary and high school teachers with regards to use of technical, practical, and emancipatory knowledge. Furthermore, I would speculate that descriptions of "wise" secondary teachers might focus more on the technical aspects of Habermas's theory, whereas, descriptions of "wise" elementary teachers might focus more on practical aspects of Habermas's theory. My hope is that this would not be the case.

VI. REFERENCES

- Adler, A. (1927). *Practice and theory of individual psychology*. New York: Harcourt Brace.
- Ammon, P., and Hutchinson, B.P., (1989). Promoting the development of teachers' pedagogical conceptions. *The Genetic Epistemologist*, 17(4), 23-29.
- Ammon, P. Levin, B.B. (1993). Expertise in teaching from a developmental perspective: The developmental teacher education program at Berkeley. *Learning and Individual Differences*, 5, 319-326.
- Anderson, J.R. (1982). Acquisition of Cognitive Skill. *Psychological Review*, 89(4), pp. 369-406.
- Arlin, P.K. (1975). Cognitive development in adulthood: a fifth stage? *Developmental Psychology*, 11(5), 602-606.
- Arlin, P.K. (1976). A cognitive process model of problem finding. *Educational Horizons*, 54, 99-106.
- Arlin, P.K. (1984). Adolescent and adult thought: A structural interpretation. In M.L. Commons, F.A. Richards, and C. Armon (Eds.), *Beyond Formal Operations: Late adolescent and adult cognitive development*, pp. 258-271. New York: Praeger.
- Arlin, P.K. (1986a). Problem finding and young adult cognition. In R.A. Mines and K. Kitchener (Eds.), *Adult cognitive development: Methods and models.*, pp. 22-32. New York: Praeger.
- Arlin, P.K. (1986b). *Teaching for Formal Reasoning*. Document prepared for the Toronto Observation Project.
- Arlin, P.K. (1989). Problem Solving and problem finding in young artists and young scientists. In (Eds.), Commons, M. and Armon, C., *Beyond Formal Operations II*, pp. 197-216.
- Arlin, P.K., (1990a). Teaching as Conversation. *Educational Leadership*, Oct., 82-84.
- Arlin, P.K. (1990b). Wisdom: The art of problem finding. In R.J. Sternberg, (Ed.), *Wisdom: Its nature, origin, and development*. Cambridge University Press.
- Arlin, P.K. (1993). Wisdom and expertise in teaching: An integration of perspectives. *Learning and Individual Differences*, 5, 341-349.

- Baltes, P.B. (1968). Longitudinal and cross-sectional sequences in the study of age and generation effects. *Human Development*, 11, 145-171.
- Baltes, P.B., Dittman-Kohli, F., and Dixon, R.A. (1984). New perspectives on the development of intelligence in adulthood: Toward a dual-component conception and a model of selective optimization with compensation. In P.B. Baltes and O.G. Brim, Jr. (Eds.), *Life-span development and behaviour* (Vol. 6, 103-135). New York: Academic Press.
- Baltes, P.B. and Smith, J. (1990). Toward a psychology of wisdom and its ontogenesis. In R.J. Sternberg, (Ed.), *Wisdom: Its nature, origin, and development*. Cambridge University Press.
- Baltes, P.B. Smith, J. Staudinger, U.M. and Sowarka, D. (1992). Wisdom: One facet of successful aging? In M. Perlmutter (Ed.), *Late-life potential*. Washington DC: Gerontological Society of America.
- Basseches, M. (1980). Dialectical schemata: A framework for the empirical study of the development of dialectical thinking. *Human Development*, 23, pp. 400-421.
- Basseches, M. (1984). Alternative characterizations of adult cognitive development. In M. Commons, F.A. Richards, C. Armon (Eds.), *Dialectical thinking and adult development*. New Jersey: Ablex.
- Bateson, G. (1973). Steps towards an ecology of mind. Okologie des Geistes, St. Albans, Herts: Paladin.
- Beach, R., and Tedick, D. (1992). *Post-Bac preservice teachers' written reflection responses to hypothetical and actual teaching situations*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco.
- Berliner, D. C., (1986). In pursuit of expert pedagogue. *Educational Researcher*, 15(7), 5-13.
- Berliner, D.C., (1987). Ways of thinking about students and classrooms by more and less experienced teachers. In J. Calderhead (Ed.), *Exploring teachers' thinking*. London: Cassell.
- Berliner, D.C., (1988). Implications of studies of expertise in pedagogy. In *new directions for teacher assessment* (Proceedings of the 1988 ETS Invitational Conference, pp. 39-68). Princeton NJ: Educational Testing Service.

- Berliner, D. C., Stein, P., Sabers, D., Brown Clarridge, P., Cushing, K., Pinnegar, S. (1989). Implications of research on pedagogical expertise and experience for mathematics teaching. *Effective Mathematics Teaching*, 67-95.
- Bloor, D. (1991). *Knowledge and social imagery* (2nd ed.). Chicago: University of Chicago Press.
- Borko, H. and Livingston, C. (1989). Cognition and improvisation: Differences in mathematics instruction by expert and novice teachers. *American Educational Research Journal*, 26(4), 473-498.
- Bransford, J.D., Sherwood, R.D., and Sturdevent, T. (1987). Teaching thinking and problem solving. In J.B. Baron and R.J. Sternberg (Eds.), *Teaching thinking skills: theory and practice*. New York: W.H. Freeman and Co., 162-181.
- Bransford, J.D., Franks, J.J., Vye, N.J., and Sherwood, R.D. (1989). New approaches to instruction: Because wisdom can't be told.
- Brent, S.B. and Watson, D. (1980). *Aging and wisdom: Individual and collective aspects*. Meeting of the Gerontology Society of America, San Francisco.
- British Columbia Ministry of Education. (1987). Year 2000 Document: The Royal Commission on Education. Victoria, British Columbia.
- Broughton, J.M. (1984). Not beyond formal operations but beyond Piaget. pp. 395-411.
- Broughton, R. (1984). A prototype strategy for the construction of personality scales. *Journal of Personality and Social Psychology*, 47, 1334-1346.
- Buss, D. and Craik, K. (1981). The frequency of concept disposition: Dominance and prototypically dominant acts. *Journal of Personality*, 48, 379-392.
- Byrnes, J.P. (1988). Formal operations: A systematic reformulation. *Developmental Review*, 8, pp. 66-87.
- Calderhead, J. (1983). *Research into teachers' and student teachers' cognitions: Exploring the nature of classroom practice*. Paper presented at the annual meeting of the American Educational Research Association, Montreal.

- Calderhead, J. (1987). Teaching as a 'professional', thinking activity. In J. Calderhead (Ed.), *Exploring Teachers' Thinking*. London: Cassell.
- Cantor, N. and Mischel, W. (1979). Prototypes in person perception. In A. Berkowitz (Ed.), *Advances in experimental social psychology*. New York: Academic Press.
- Carnegie Task Force on Teaching as a Profession. (1986). *A nation prepared: Teachers for the 21st Century*. Washington DC: Carnegie Forum on Education and the Economy.
- Carter, K., Cushing, K., Sabers, D., Pinnegar, S., and Berliner, D. (1987). Processing and using information about students: A study of expert, novice, and postulant teachers. *Teaching and Teacher Education*, 3, 147-157.
- Carter, K., Cushing, K., Sabers, D., Stein, P., and Berliner, D. (1988). Expert-novice differences in perceiving and processing visual classroom stimuli. *Journal of Teacher Education*, 39, 25-31.
- Case, R. (1992). Neo-Piagetian theories of intellectual development. In H. Beilen, and P. Pufall (Eds.), *Piaget's Theory: Prospects and Possibilities*. Hillsdale, NJ: Erlbaum.
- Cattell, R.B. (1963). Theory of crystallized and fluid intelligence: A critical experiment. *Journal of Educational Psychology*, 54, 1-22.
- Chandler, M.J. and Holliday, S. (1990). Wisdom in a postapocalyptic age. In R.J. Sternberg, (Ed.), *Wisdom: Its Nature, Origin, and Development*. Cambridge University Press.
- Chi, M. T. H., Feltovich, P. J., and Glaser, R. (1981). Categorization and representation of physics problems by experts and novices. *Cognitive Science*, 5, 121-152.
- Chi, M T. H., Glaser, R., and Rees, E. (1983). Expertise in problem-solving. In R. Sternberg (Ed.), *Advances in the psychology of human intelligence*, 7 (pp. 7-76). Hillsdale, NJ: Lawrence Erlbaum.
- Clark, C., Clark, G., Fidler, M. and Underwood, D. (1993). Wisdom and expertise: From practice to theory and back again. *Learning and Individual Differences*, 5, 373-380.
- Clark, C.M., and Yinger, R.J. (1987). Teacher planning. In J. Calderhead (Ed.), *Exploring Teachers' Thinking*. London: Cassell.

- Clayton, V.P. and Birren, J.E. (1980). The development of wisdom across the life-span: A reexamination of an ancient topic. In P.B. Baltes and O.G. Brim, Jr. (Eds.), *Life-span Development and Behaviour* (103-135). New York: Academic Press.
- Clayton, V.P. (1982). Wisdom and intelligence: The nature and function of knowledge in the later years. *International Journal of Aging and Human Development*, 15, 315-323.
- Clifford, P. and Friesen, S. (1994). Improving Schools from Within: Creating Successful Classrooms. *Harvard Educational Review*. Harvard University Press.
- Cobb, P. (1988). The tension between theories of learning and instruction in mathematics education. *Educational Psychologist*, 23, 87-103.
- Cohen, J.M. (Trans.) (1958). *Michel de Montaigne: Essays*. London: Penguin.
- Commons, M. and Richards, F.A. (1984). Systematic, metasystematic, and cross-paradigmatic reasoning: A case for stages of reasoning beyond Piaget's stage of formal operations. In M. Commons, F.A. Richards, C. Armon (Eds.), *Beyond Formal Operations: Late Adolescent and Adult Cognitive Development*. New York: Praeger.
- Csikszentmihalyi, M. and Rathunde, K. (1990). The psychology of wisdom: an evolutionary interpretation. In R.J. Sternberg, (Ed.), *Wisdom: Its Nature, Origin, and Development*. Cambridge University Press.
- de Groot, A.D. (1965). *Thought and Choice in Chess*. The Hague: Mouton.
- Dewey, J. (1933). *How We Think*. New York: Heath.
- Dewey, J. (1963). *Experience and Education*. New York: MacMillan.
- Dewey, J. (1966). *Democracy and Education*. New York: Free Press.
- Dewey, J. (1966). *The Child and the Curriculum and the School and Society*. Chicago: University of Chicago Press.
- Dittmann-Kohli, F. and Baltes, P.B. (1985). Toward a neofunctionalist conception of adult intellectual development: Wisdom as a prototypical case of intellectual growth. In C. Alexander and E. Langer (Eds.), *Beyond Formal Operations: Alternative Endpoints to Human Development*. New York: Oxford University Press.

- Dixon, R.A. and Baltes, P.B. (1986). Toward life-span research on the functions and pragmatics of intelligence. In R.J. Sternberg's and R.K. Wagner (Eds.), *Practical Intelligence: Nature and Origins of Competence in the Everyday World*. New York: Cambridge University Press.
- Doyle, W. (1986). Classroom organization and management. In M.C. Wittrock (Ed.), *Handbook of Research on Teaching, 3rd Edition*. New York: MacMillan.
- Duckworth, E. (1986). Teaching as research. *Harvard Educational Review*, 56(4), 16-30.
- Dweck, C.S. and Elliot, E.S. (1983). Achievement motivation. In P.H. Mussen (Ed.) *Handbook of Child Psychology*. New York: Wiley.
- Egan, K. (1986). *Teaching as Story Telling*. Chicago: University of Chicago Press.
- Ericson and Simon (1980). Verbal reports as data, *Psychological Review*, 87, 215-251.
- Erikson, E. H. (1959). Identity and the life cycle. *Psychological Issues*. 1(1). New York: International Universities Press.
- Fine, M. (1994). "You can't just say that the only ones who can speak are those who agree with your position": Political discourse in the classroom. Improving Schools from Within: Creating Successful Classrooms. *Harvard Educational Review* (Special Edition) Harvard University Press.
- Flavell, J.H. (1982). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906-911.
- Flavell J.H. (1992). Cognitive Development: Past, present, and future. *Developmental Psychology*, 28(6), 998-1005.
- Foreman, G.E. (1989). Helping Children Ask Good Questions. In B. Neugebauer (Ed.), *The Wonder of it: Explaining how the World Works*. Redmond, WA.: Exchange Press.
- Freeman, M. (1985). Paul Ricoeur on interpretation: The model of the text and the idea of development. *Human Development*, 28, 295-312.
- Gagne, R.M. (1977). *The Conditions of Learning* (3rd ed.). New York: Holt, Rinehart, and Winston.

- Gee, P. (1992). *The Social Mind. Language Ideology, and Social Practice*. New York: Bergin and Garvey.
- Gibbs, M. (1987). *Tribes: A Process for Social Development and Cooperative Learning*. Santa Rosa: Center for Source Publications.
- Glass, G.V. and Hopkins, K.D. (1984). *Statistical Methods in Education and Psychology* (2nd ed.). Englewood Cliffs, New Jersey: Prentice-Hall.
- Goodlad, J.I. (1984). *A Place Called School: Prospects for the Future*. Toronto, Ont: McGraw-Hill.
- Greene, M. (1973). *The Teacher as Stranger*. Belmont, Calif.: Wadsworth.
- Greene, M. (1986). Reflection and passion in teaching. *Journal of Curriculum and Supervision*, 2, 68-81.
- Greene, M. (1988). *The Dialectic of Freedom*. New York: Teacher's College Press.
- Grimmett, P.P. and Erikson, G.L. (1988). *Reflection in Teacher Education*. Vancouver, Pacific Educational Press.
- Grundy, S. (1987). *Curriculum: Product or Praxis?* London: Falmer Press.
- Habermas, J. (1970). *Knowledge and Human Interests*. Boston: Beacon Hill Press.
- Holliday, S.G. and Chandler, M.J. (1986). *Wisdom: Explorations in adult competence*. Basel Switzerland: Karger.
- The Holmes Group (1986). *Tomorrow's teacher: A report of the Holmes Group*. East Lansing, MI: Author.
- Horn, J.L. (1970). Organization of data on life-span development of human abilities. In L.R. Goulet and P.B. Baltes (Eds.), *Life-span Developmental Psychology: Research and Theory*. New York: Academic Press.
- Housner, L. D., and Griffey, D. C. (1985). Teacher Cognition: Differences in planning and interactive decision-making between experienced and inexperienced teachers. *Research Quarterly for Exercise and Sport*, 56, 45-53.
- Inhelder, B., and Piaget, J. (1958). *The Growth of Logical Thinking from Childhood to Adolescence*. New York: Basic Books.

- Jackson, P.W. (1968). *Life in Classrooms*. New York: Teachers College Press.
- Johnson, E.J. (1988). Expertise and decision under uncertainty: Performance and process. In M.T.H. Chi, R. Glaser and M.J. Far (Eds.), *The Nature of Expertise*. Hillsdale, NJ: Lawrence Erlbaum.
- Jung, K. (1960). The stages of life. In H. Read, M. Fordam, G. Adler, and W. Mcguire (Eds.), *The Collected Works of C.G. Jung* (Vol. 8). Princeton NJ: Princeton University Press.
- Kagan, D.M. and Tippins, D.J. (1991, April). *How Preservice Teachers "Read" Classroom Performance*. Paper presented at the annual meeting of the American Educational Research Association, Chicago.
- Kagan, D.M. (1992). Professional growth among preservice and professional teachers. *Review of Educational Research*, 62(2), 129-169.
- Kagan, J. (1984). Guiding themes in human development. In J. Kagan (Ed.), *The Nature of the Child*. New York: Basic Books.
- Kekes, J. (1983). Wisdom. *American Philosophical Quarterly*, 20, 1-22.
- Kalish, R. (1981). The new ageism and the failure models: A polemic. In B. Wershow (Ed.), *Controversial Issues in Gerontology*. New York: Springer.
- Kamii, C. and Clark, F.B. (1993). Autonomy: The importance of a scientific theory in educational reform. *Learning and Individual Differences*, 5, 327-340.
- Kemmis, S. and Carr, W. (1986). *Becoming Critical: Education, Knowledge and Action Research*. Philadelphia: Falmer Press.
- King, P.M., Kitchener, K.S., Davidson, M., Parker, C.A., and Wood, P.K. (1983). The justification of beliefs in young adults, longitudinal study. *Human Development*, 26, 106-116.
- Kitchener, K.S., Lynch, C.L., Fischer, K.W., and Wood, P.K. (1993). Developmental range of reflective judgment: The effect of contextual support and practice on developmental stage. *Developmental Psychology*, 29(5), 893-906.
- Knowles, M. (1980). *The modern practice of adult education*. Chicago: Association Press.

- Kramer, D.A. (1990). Conceptualizing wisdom: The primacy of affect-cognition relations. In R.J. Sternberg, (Ed.), *Wisdom: Its Nature, Origin, and Development*. Cambridge University Press.
- Labouvie-Vief, G., and Chandler, M.J. (1978). Cognitive development and life-span developmental theory: Idealistic versus contextual perspectives. In P.B. Baltes and O.G. Brim, Jr. (Eds.), *Life-span Development and Behaviour* (103-135). New York: Academic Press.
- Labouvie-Vief, G., and Lawrence, R. (1985). Object knowledge, personal knowledge and processes of equilibration in adult cognition. *Human Development*, 28, 25-39.
- Labouvie-Vief, G. (1990). Wisdom as integrated thought: Historical and developmental perspectives. In R.J. Sternberg, (Ed.), *Wisdom: Its Nature, Origin, and Development*. Cambridge University Press.
- Lave, J. (1988). *Cognition in Practice*. Cambridge, England: Cambridge University Press.
- Lee, D.M. (1989). Everyday problem solving: Implications for education. In J.D. Sinnott's (Ed.), *Everyday Problem Solving: Theory and Application*. New York: Praeger.
- Lee, D.M. (1993). The place of wisdom in teaching. *Learning and Individual Differences*, 5, 301-317.
- Leinhardt, G., and Smith, D.A., (1985). Expertise in mathematics instruction: Subject matter knowledge. *Journal of Educational Psychology*, 77(3), 247-271.
- Leinhardt, G., and Greeno, J. G. (1986). The cognitive skill of teaching. *Journal Educational Psychology*, 78, 75-95.
- Liben, L.S., (1987). Information processing and Piagetian theory: Conflict or congruence? In L.S. Liben (Ed.), *Development and Learning: Conflict or Congruence*. Hillsdale, NJ: Erlbaum.
- Levitt, L. (1988). Teaching from the student's point of view: A developmental perspective. Unpublished Master's Thesis. University of British Columbia, Vancouver.
- Lickona, T. (1991). *Educating for Character: How our Schools can Teach Respect and Responsibility*. New York: Bantam.
- Mackworth, (1965). Originality. *American Psychologist*, (20), pp.51-66.
- Marcel, G. (1951). *The Decline of Wisdom*. London: Harvill Press.

- Meacham, J.A. (1983). Wisdom and the context of knowledge: knowing that one doesn't know. In D. Kuhn and J.H. Meacham (Eds.), *On the Development of Developmental Psychology*. Basel Switzerland: Karger.
- Meacham, J.A. and Emont, N.C. (1989). The interpersonal basis of everyday problem solving. In J.D. Sinnott's (Ed.), *Everyday Problem Solving: Theory and Application*. New York: Praeger.
- Meacham, J.A. (1990). The loss of wisdom. In R.J. Sternberg, (Ed.), *Wisdom: Its Nature, Origin, and Development*. Cambridge University Press.
- Meek, A. (1991). On thinking about teaching: A conversation with Eleanor Duckworth. *Educational Leadership*, March, 3-34.
- Miller, A.I. (1987). *Imagery and Scientific Thought*. Cambridge, MA: MIT Press.
- Murphy, G.L., and Wright, J.C. (1984). Changes in conceptual structure with expertise: Differences between real-world experts and novices. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 10(1), 144-155.
- Neisser, U. (1979). The concept of intelligence. *Intelligence*, 3, 217-227.
- Orwell, L. and Perlmutter, M. (1990). The study of wise persons: Integrating a personality perspective. In R.J. Sternberg, (Ed.), *Wisdom: Its Nature, Origin, and Development*. Cambridge University Press.
- Paley, V.G. (1986). On Listening to What Children Say. *Harvard Educational Review*, 56(2), pp. 122-131.
- Pascual-Leone, J. (1983). Growing into human maturity: towards a metasubjective theory of adulthood stages. In P.B. Baltes and O.G. Brim (Eds.), *Life-span development and behaviour*, (vol 5 pp. 117-156). New York: Academic Press.
- Pascual-Leone, J. (1990). An essay on wisdom: Toward organismic processes that make it possible. In R.J. Sternberg, (Ed.), *Wisdom: Its Nature, Origin, and Development*. Cambridge University Press.
- Pepper, S.C. (1942). *World Hypotheses*. Berkeley: University of California.

- Perry, W.G. (1968). *Forms of Intellectual and Ethical Development in the College Years*. New York: Holt, Rinehart, and Winston.
- Piaget, J. (1948). From Kramer 1985. In edited volume concerning teaching math.
- Piaget, J. (1985). *The Equilibration of Cognitive Structures: The Central Problem of Intellectual Development*. Chicago: University of Chicago Press.
- Posner, M.I. (1988). Introduction: What is it to be an expert? In M.T.H. Chi, R. Glaser, M.J. Farr (Eds.), *The Nature of Expertise*. Hillsdale, NJ: Lawrence Erlbaum.
- Prawat, R.S. (1992). Teachers' beliefs about teaching and learning: A constructivist perspective. *American Journal of Education*, May, 354-395.
- Prawat, R.S. (1993). The value of ideas: problems versus possibilities in learning. *Educational Researcher*, 22(6), 5-16.
- Province of British Columbia, Ministry of Education (1989). *The Primary Program*.
- Riegel, K.F. (1972). Influences of economic and political ideologies on the development of developmental psychology. *Psychological Bulletin*, 78, 129-141.
- Riegel, K.F. (1973). Dialectics operations: the final period of cognitive development. *Human Development*, 16, 346-370.
- Riegel, K.F. (1976). The dialectics of human development. *American Psychologist*, 31, 689-700.
- Riegel, K.F. (1977). The history of psychological gerontology. In Birren, J.E. and Schaie, C. (Eds.), *Handbook of the Psychology of Aging*. New York: Van Nostrand Reinhold.
- Robinson, D.N. (1990). Wisdom through the ages. In R.J. Sternberg, (Ed.), *Wisdom: Its Nature, Origin, and Development*. Cambridge University Press.
- Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. New York: Oxford University Press.
- Rosch, E. (1975). Cognitive representations of semantic categories. *Journal of Experimental Psychology: General*, 104, 192-233.

- Rowles, E. (1991). The Nature of Teacher Expertness and its Attainment. Unpublished Education Doctorate, University of British Columbia, Vancouver.
- Sameroff, A.J. (1983) Developmental systems: Contexts and evolution. In P.H. Mussen (Ed.) *Handbook of Child Psychology*. New York: Wiley.
- Schaps, E. and Solomon, D..(1990). Schools and classrooms as caring communities. *Educational Leadership*, November, 38-42.
- Scheffler, I. (1985). *Of human potential: An essay in the philosophy of education*. Boston, MA: Routledge & Kegan Paul.
- Schon, D.A. (1983). *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books.
- Schwartz, D. (1977). *The Study of Interpersonal Problem Posing*. Unpublished Ph.D. thesis, University of Chicago.
- Seigler, R.S., and Crowley, K. (1991). The microgenetic method: A direct means for studying cognitive development. *American Psychologist*, 46, 606-620.
- Seigler, R.S., and Jenkins, E. (1989). *How Children Discover New Strategies*. Hillsdale, NJ: Erlbaum.
- Shavelson, R.J., and Stern, P. (1981). Research on teachers pedagogical thoughts, judgements, decisions, and behaviour. *Review of Educational Research*, 51(4), 455-498.
- Shulman, L.S. (1986a). Paradigms and research programs for the study of teaching. In M.C. Wittrock (Ed.) *Handbook of research on teaching*. New York: MacMillan.
- Shulman, L.S. (1986b). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4-14.
- Shulman, L.S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57(1), 1-22.
- Simon, D. P., and Simon, H. A. (1978). Individual differences in solving physics problems. In R.S. Siegler (Ed.), *Children's Thinking: What Develops?* Hillsdale, N.J.: Erlbaum.
- Sinnott, J.D. (1984). Postformal reasoning: The relativistic stage. In M. Commons, F.A. Richards, C. Armon (Eds.), *Beyond Formal Operations: Late Adolescent and Adult Cognitive Development*. New York: Praeger.

- Sinnott, J.D. (1989). Background: About this book and the field of everyday problem solving. In J.D. Sinnott's (Ed.), *Everyday Problem Solving: Theory and Application*. New York: Praeger.
- Sinnott, J.D. (1989). A model for solution of ill-structured problems: Implications for everyday and abstract problem solving. In J.D. Sinnott's (Ed.), *Everyday Problem Solving: Theory and Application*. New York: Praeger.
- Sinnott, J.D. (in press). Introduction. In J.D. Sinnott (Ed.), *Handbook of Adult Lifespan Learning*. Greenwood Publishing.
- Skinner, B.F. (1953). *Science and Human Behaviour*. New York: MacMillan.
- Sowarka, D. (1987). *Wisdom in the context of persons, situations, and actions: Common sense views of elderly men and women*. Unpublished doctoral dissertation. Free University of Berlin and Max Plank Institute for Human Development and Education, Berlin, Federal Republic of Germany.
- Sprinthall, N.A., Reiman, A.J. and Theis-Sprinthall, L. (1993). Roletaking and reflection: Promoting the conceptual and moral development of teachers. *Learning and Individual Differences*, 5, 283-299.
- Sternberg, R.J., Conway, B.E. Ketron, B.L., and Bernstein, M. (1981). People's conceptions of intelligence. *Journal of Personality and Social Psychology*, 41, 37-55.
- Sternberg, R.J. (1990). Wisdom and its relations to intelligence and creativity. In R.J. Sternberg, (Ed.), *Wisdom: Its Nature, Origin, and Development*. Cambridge University Press.
- Stipek, D.J. (1981). Children's perceptions of their own and their classmates abilities. *Journal of Educational Psychology*, 73, 404-410.
- Strohm-Kitchener, K. and Brenner, H.G. (1990). Wisdom and reflective judgment: Knowing in the face of uncertainty. In R.J. Sternberg, (Ed.), *Wisdom: Its Nature, Origin, and Development*. Cambridge University Press.
- Sullivan, H.S. (1953). *The Interpersonal Theory of Psychiatry*. New York: W.W. Norton.

- Swanson, H. L., O'Conner, J. E., and Cooney, J. B. (1990). An information processing analysis of expert and novice teachers' problem solving. *American Educational Research Journal*, 27, 533-536.
- Sylvester, P. (1994). Elementary school curricula and urban transformation. Improving Schools from Within: Creating Successful Classrooms. *Harvard Educational Review* (Special Edition). Harvard University Press.
- Tabachnick, B.G. and Fidell L.S. (1989). *Using Multivariate Statistics*. (2nd Ed.). Harper & Row: New York.
- Thorngate, W. (1981). The Experience of Wisdom. Report submitted to the Social Sciences Research Council of Canada.
- Throne, J. (1994). Living with the pendulum: The complex world of teaching. In Improving Schools from Within: Creating Successful Classrooms. *Harvard Educational Review* (Special Edition). Harvard University Press.
- Tobin, K., Tippins, D., and Hook, K., (1992). The construction and reconstruction of knowledge. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, April, 1992.
- Ventis, D.G. (1989). Cognitive Intervention: A review and implications for everyday problem solving. In (Ed.), J.D. Sinnott's *Everyday Problem Solving: Theory and Application*. New York: Praeger.
- Voss, J.F. and Post, T.A. (1988). On the solving of ill-structured problems. In (Eds.), M.T.H. Chi, R. Glaser, and M.J. Farr *The Nature of Expertise*. Hillsdale: New Jersey.
- Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wagner, A.C. (1987). "Knots" in teachers' thinking. In J. Calderhead (Ed.), *Exploring Teachers' Thinking*. London: Cassell.
- Weiner, B. (1979). A theory of motivation for some classroom experiences. *Journal of Educational Psychology*, 71, 3-25.
- Weinstein, R.S. and Middlestadt, S.E., (1979). Student perceptions of difficult teacher treatment in open and traditional classrooms. *Journal of Educational Psychology*, 71, 421-431.

- Welker, R. (1991). Expertise and the teacher as expert: Rethinking a questionable metaphor. *American Educational Research Journal*, 28(1), 19-36.
- Wentzel, K.R. and Erdley, C.A. (1993). Strategies for making friends: Relations to Social behaviour and peer acceptance in early adolescence. *Developmental Psychology*, 29(5), 819-826.
- Wiggins, D. (1978). Deliberation and practical reason. In J. Raz (Ed.), *Practical Reasoning*. New York: Oxford University Press.
- Wilson, S.M., Shulman, L.S., and Richert, A.E., (1987). "150 different ways" of knowing: Representations of knowledge in teaching. In J. Calderhead (Ed.), *Exploring Teachers' Thinking*. London: Cassell.
- Wittrock, M.C., (1978). The cognitive movement in instruction. *Educational Psychologist*, 13, 15-30.
- Wittrock, M.C. (1986). Students' thought processes. In M.C. Wittrock (Ed.), *Handbook of Research on Teaching*, 3rd Edition. New York: MacMillan.
- Wood, P.K. (1983). Inquiring systems and problem structure: Implications for cognitive development. *Human Development*, 26, 249-265.
- Wolfe, J. M., and Murray, C. K. (1991, April). *Thinking of oneself as a "real" teacher: negotiating a stance toward teacher role in student teaching*. Paper presented at the annual meeting of the American Educational Research Association, Chicago.
- Yackel, E., Cobb, P., and Wood, T. (1991). Small-group interactions as a source of learning opportunities in second-grade mathematics. *Journal for Research in Mathematics Education*, 22, 390-408.
- Yinger, R.J. and Hendricks-Lee, M.S. (1993). An ecological conception of teaching. *Learning and Individual Differences*, 5, 269-281.

VII. APPENDIX A

A. EXPERTISE DESCRIPTORS IN DESCENDING ORDER

N=30 TOTAL=230 MEAN=7.67

1. 16 SIMILAR DESCRIPTORS LABELED "OPEN-MINDED": open-minded, open-minded, open to suggestions, open to new ideas, open to criticism, open to constructive criticism, broad-minded, versatile, flexible, flexible, flexible, flexible, flexible, able to adapt to classroom situations, adaptability, adaptable.

2. 15 SIMILAR DESCRIPTORS LABELED "WILLING TO CHANGE OR EVOLVE": willing to change or evolve, not afraid to change and experiment, willing to learn, continues to learn about subject area, constantly learning more about their subject, aware of new developments in teaching, kept abreast of their field, informed of new developments in their field, keeps updated on changes in the field, stays on top of current issues, aware of how their subject has evolved and its importance in the world, changes teaching methods, willing to try other teaching and learning strategies, use a variety of teaching strategies, committed to life-long learning.

3. 12 SIMILAR DESCRIPTORS LABELED "INTELLIGENT, GENERALLY KNOWLEDGEABLE": knowledgeable, knowledgeable, knowledgeable, knowledgeable, wide knowledge base, problem solver, intelligent, quick thinker, well-read, well-read, well-informed, well-educated.

4. 11 SIMILAR DESCRIPTORS LABELED "UNDERSTANDING, SHOWS EMPATHY": understanding, understanding, understanding, sympathetic, empathetic, empathy, understands young people, understanding, empathetic, empathetic, attentive to student needs.

5. 10 SIMILAR DESCRIPTORS LABELED "APPROACHABLE": approachable, approachable, approachable, friendly, friendly, good natured, easy going, good rapport with students, good rapport with students, good rapport with students.

6. 2 SIMILAR DESCRIPTORS LABELED "THOROUGH KNOWLEDGE OF SUBJECT AREA, KNOWS SUBJECT AREA VERY WELL": conversant in the subject matter, knows subject material well, knowledge of subject area, teacher who knows the topic inside-out, knowledgeable of topic being taught, knows subject material, knows content very well, knows content, skilled and knowledgeable in a variety of subjects.
7. 8 SIMILAR DESCRIPTORS LABELED "CONSISTENT, RELIABLE": consistent, consistent, consistent, consistent, reliable, reliable, responsible, responsible.
8. 8 SIMILAR DESCRIPTORS LABELED "PATIENT": patient, patient, patient, patient, patient, patience, patient, patience.
9. 8 SIMILAR DESCRIPTORS LABELED "FAIR": fair, fair, fair, fair, fair, fair, fair, fairness.
10. 7 SIMILAR DESCRIPTORS LABELED "INTERESTING, LESSONS GRAB STUDENTS' ATTENTION": interesting, lessons grab students attention, interesting, interesting, interesting, stimulating, maintains class attention.
11. 7 SIMILAR DESCRIPTORS LABELED "COMMUNICATES CLEARLY": communicates clearly, clear instructions, communicates clearly, clear, excellent communication skills, listener, good listener.
12. 7 SIMILAR DESCRIPTORS LABELED "CARING": caring, caring, caring, sensitive, supportive, nurturing, giving.
13. 7 SIMILAR DESCRIPTORS LABELED "DISCIPLINED CLASSROOM MANAGER, GIFT FOR KEEPING STUDENTS ON TASK AND IN CONTROL": disciplined classroom management, disciplinarian, firm, gift for keeping students on task and in control, good managers, classroom management skills, manage time well.
14. 6 SIMILAR DESCRIPTORS LABELED "EXPERIENCE, EXPERIENCE WITH SUBJECT AREA": experience with subject area, experienced, experienced in a variety of teaching fields, experienced, experienced, taught in variety of situations and a variety of students.
15. 6 SIMILAR DESCRIPTORS LABELED "DEDICATED, COMMITTED": hard-working, hard-working, hard worker, dedicated, committed, committed.
16. 6 SIMILAR DESCRIPTORS LABELED "WITH-IT, STREET-SMART": with-it, with-it, with-it, street smart, attuned, in tune with students.

17. 6 SIMILAR DESCRIPTORS LABELED "ENTHUSIASTIC": enthusiasm, excited about subject area, enthusiastic, enthusiasm, enthusiastic, passionate, energetic, outgoing.
18. 6 SIMILAR DESCRIPTORS LABELED "SENSE OF HUMOUR": sense of humor, sense of humor, sense of humor, witty, fun, fun.
19. 6 SIMILAR DESCRIPTORS LABELED "REFLECTIVE": reflective, reflective, reflective, critical thinker, critical thinker, critical thinker.
20. 5 SIMILAR DESCRIPTORS LABELED "PROFESSIONAL, PROFICIENT": professional, professional, proficient, effective, efficient.
21. 5 SIMILAR DESCRIPTORS LABELED "INTERESTED, INVOLVED": interest, interested, involved, interested in topic, involved in all aspects of school.
22. 5 SIMILAR DESCRIPTORS LABELED "ENCOURAGING": encouraging, encouraging, encouraging, encouraging, encourage.
23. 5 SIMILAR DESCRIPTORS LABELED "CREATIVE": creative, creative, creative, imaginative, resourceful.

The remaining descriptors were not used in the analysis.

- 4 SIMILAR DESCRIPTORS: relates material to student experience, makes content relevant to students' lives, makes content relevant to students' lives, relate classroom to world.
- 4 SIMILAR DESCRIPTORS: acknowledges individual differences, treat students as individuals, account for individual differences, tolerant of differences.
- 3 SIMILAR DESCRIPTORS: considers learner first when teaching, involves students in learning, involves students in learning.
- 3 SIMILAR DESCRIPTORS: cooperative, cooperative, cooperative.
- 3 SIMILAR DESCRIPTORS: challenge, challenging, challenges students.
- 3 SIMILAR DESCRIPTORS: respected by students, respected, respected.

3 SIMILAR DESCRIPTORS: moral consistency, non-racist, non-sexist.

2 SIMILAR DESCRIPTORS: perceptive, good reader of human nature.

2 SIMILAR DESCRIPTORS: older, more mature.

2 SIMILAR DESCRIPTORS: goal oriented, focused.

2 SIMILAR DESCRIPTORS: charismatic, charismatic.

2 SIMILAR DESCRIPTORS: thick-skinned, tolerant.

2 SIMILAR DESCRIPTORS: trustworthy, trustworthy.

2 SIMILAR DESCRIPTORS: respectful of students, respectful of students.

2 SIMILAR DESCRIPTORS: responds to students' needs, interested in whole student.

1 DESCRIPTOR: focus on concepts not facts.

1 DESCRIPTOR: computer literate.

1 DESCRIPTOR: representative.

1 DESCRIPTOR: enjoys working with children.

1 DESCRIPTOR: creates positive classroom environment.

1 DESCRIPTOR: unpredictable.

1 DESCRIPTOR: allow students to learn through discovery.

1 DESCRIPTOR: unorthodox.

1 DESCRIPTOR: objective.

1 DESCRIPTOR: good judgment.

1 DESCRIPTOR: classroom awareness.

B. WISDOM DESCRIPTORS IN DESCENDING ORDER

N=30 TOTAL=274 MEAN=9.13

1. 23 SIMILAR DESCRIPTORS LABELED "OPEN-MINDED": open minded, open, open, open, open to change, receptive, adaptive, open to other points of view, adaptable, open-mindedness, listens to advice, evaluates flexibly, flexible, flexible, flexible, flexible, flexible, accepting, changing, lenient, accepts without judging, puts aside their biases opinions and prejudices when dealing with students, compensatory.
2. 16 SIMILAR DESCRIPTORS LABELED "ORGANIZED, PREPARED": prepared, prepared, prepared, prepared, organized, efficient, economic, organization, organization, good time managers, allocate time efficiently, time management, punctual, classroom manager, classroom control, keeps class busy.
3. 13 SIMILAR DESCRIPTORS LABELED "INTELLIGENT, GENERALLY KNOWLEDGEABLE": knowledge, knowledge, knowing, cognition, meta-cognition, educated, breadth of knowledge, intelligent, good memory, informed, informed, competent, uses knowledge beneficially.
4. 10 SIMILAR DESCRIPTORS LABELED "THOUGHT PROVOKING": advocating, supportive, helpful, allow students to be involved in decision making, dwells on positive aspect of children's responses, allows students to discover knowledge for themselves, allows students to discover knowledge for themselves, discusses controversy, presents opposing views, thought provoking.
5. 10 SIMILAR DESCRIPTORS LABELED "REFLECTIVE": reflective, reflective, thinks before they speak, weighs decisions, reflective, calculating, reflective, introspective, inquiring, constructively criticize.
6. 9 SIMILAR DESCRIPTORS LABELED "UNDERSTANDING, SHOWS EMPATHY": understanding, understanding, understanding, compassionate, compassionate, compassionate, humane, human, human.
7. 9 SIMILAR DESCRIPTORS LABELED "CALM": able to bypass emotions, calm, calm, clam, relaxed, composed, in control, emotional control, in control.

8. 8 SIMILAR DESCRIPTORS LABELED "THOROUGH KNOWLEDGE OF SUBJECT AREA, KNOWS SUBJECT AREA VERY WELL": knowledgeable in subject area, knowledgeable about many subjects, knows the subject matter, thorough knowledge of subject matter, knows subject area very well, knowledge of educational system and their place in it, knowledgeable about many subjects, extensive content area knowledge.

9. 8 SIMILAR DESCRIPTORS LABELED "EXPERIENCE, EXPERIENCE WITH SUBJECT AREA": experience with subject area, experienced, experienced in a variety of teaching fields, experienced, experienced, taught in variety of situations and a variety of students, experienced, experience.

10. 8 SIMILAR DESCRIPTORS LABELED "CLASSROOM AWARENESS, OBSERVANT": observant, observant, attentive, aware, aware, alert, awake, awareness.

11. 8 SIMILAR DESCRIPTORS LABELED "INTERESTED, INVOLVED": interested, interested, interested, involved, interested, involved, involved, involved.

12. 8 10 similar DESCRIPTORS LABELED "CREATIVE": creative, creative, resourceful, resourceful, resourceful, resourceful, innovative, insightful.

13. 7 SIMILAR DESCRIPTORS LABELED "SENSE OF HUMOUR": sense of humor, good humored, funny, sense of humor, sense of humor, humorous, fun.

14. 7 SIMILAR DESCRIPTORS LABELED "TEACHING RELATES TO STUDENTS' EXPERIENCES": relates life and school, prepares student for life, teaching relates to students' experiences, relates to students' needs, relate curriculum to students' lives, relates to students' needs, integrates learning and real world.

15. 7 SIMILAR DESCRIPTORS LABELED "ENTHUSIASTIC": enthusiastic, enthusiastic, enthusiastic, enthusiastic, enthusiastic, eager.

16. 6 SIMILAR DESCRIPTORS LABELED "WITH-IT, STREET-SMART": culturally literate, street-smart, "together", "with-it", with-it, connected to the real world.

17. 6 SIMILAR DESCRIPTORS LABELED "APPROACHABLE": approachable, reachable, friendly, "phoneable," good listener, listens, gracious.

18. 6 SIMILAR DESCRIPTORS LABELED "RECOGNIZES INDIVIDUAL DIFFERENCES OF STUDENTS": recognizes individual differences of students, recognizes individual needs of students, loves each child for who they are, adapt to different learning styles, adapt to different learning styles, teaches to level of students.

19. 6 SIMILAR DESCRIPTORS LABELED "ACCOUNTABLE": accountability, accountability, responsible, not afraid to admit error, takes criticism, can justify decisions.

20. 6 SIMILAR DESCRIPTORS LABELED "GENEROUS": generous, generous, good willed, kind, unselfish, altruistic.

21. 5 SIMILAR DESCRIPTORS LABELED "MAKES SOUND DECISIONS": sound decisions, makes sound decisions, makes sound decisions in unexpected situations, logical decisions, conclusive decisions.

22. 5 SIMILAR DESCRIPTORS LABELED "CARING": caring, caring, caring, caring, sensitive..

23. 5 SIMILAR DESCRIPTORS LABELED "PATIENT": patient, patient, patient, patient, patient, patient.

24. 5 SIMILAR DESCRIPTORS LABELED "FAIR": fair, fair, fair, fair, fair.

The remaining descriptors were not used in the analysis because frequency was less than five.

4 SIMILAR DESCRIPTORS: will search out information on topics unsure of, willing to learn, actively seeks out new knowledge, likes to learn.

4 SIMILAR DESCRIPTORS: old, over forty, retired, retired.

4 SIMILAR DESCRIPTORS: worldly, worldly, worldly, worldly.

4 SIMILAR DESCRIPTORS: socially aware, social skills, socially aware, socially aware.

4 SIMILAR DESCRIPTORS: clean, attractive, healthy, healthy.

4 SIMILAR DESCRIPTORS: respectful, respectful, respectful, respectful of students' point of view.

- 4 SIMILAR DESCRIPTORS: honest, honest, truthful, has integrity.
- 4 SIMILAR DESCRIPTORS: objective, objective, objective, objective.
- 4 SIMILAR DESCRIPTORS: humble, modest, humble, unassuming.
- 3 SIMILAR DESCRIPTORS: tactful, diplomatic, careful with what they say.
- 3 SIMILAR DESCRIPTORS: good advice, sought out for advice, good judgment.
- 3 SIMILAR DESCRIPTORS: subject mastery is not enough, knows that they cannot know everything, know that knowledge is not wisdom.
- 3 SIMILAR DESCRIPTORS: knows pitfalls of certain decisions made or paths taken, knows when to act or not, prepared in unexpected situations.
- 3 SIMILAR DESCRIPTORS: proactive, catch problems before they get out of hand, anticipates learning and management problems before they start.
- 3 SIMILAR DESCRIPTORS: encouraging, encourages discussion, encourages child's point of view.
- 3 SIMILAR DESCRIPTORS: experienced in life, life experiences, uses past experiences.
- 3 SIMILAR DESCRIPTORS: communicates clearly, communicative, descriptive.
- 3 SIMILAR DESCRIPTORS: will change lessons from class to class or year to year, accepting, tries different teaching styles, presents material in variety of ways.
- 2 SIMILAR DESCRIPTORS: totally committed to teaching, dedicated, tenacious.
- 2 SIMILAR DESCRIPTORS: inspirational, motivator.
- 2 SIMILAR DESCRIPTORS: confident, self-confident.
- 2 SIMILAR DESCRIPTORS: self-evaluative, evaluative.
- 1 DESCRIPTOR: consistent.

1 DESCRIPTOR: careful.

1 DESCRIPTOR: active.

1 DESCRIPTOR: happy.

1 DESCRIPTOR: popular.

1 DESCRIPTOR: democratic.

1 DESCRIPTOR: cooperates with co-workers.

1 DESCRIPTOR: direct-not control the classroom.

1 DESCRIPTOR: positive role model.

1 DESCRIPTOR: gives students space.

1 DESCRIPTOR: proud.

VIII. APPENDIX B

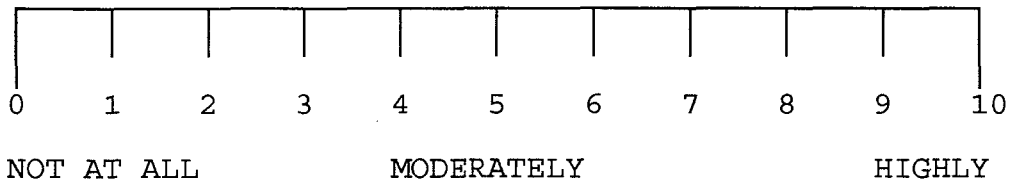
A. WISDOM IN TEACHING SCALE

This study has to with people's ideas about categories. A category is like a concept, and includes many instances of similar things, sharing the same name, or label. For example, think of the category DOG. We can imagine many different kinds of dogs - poodles, terriers, German shepherds, and so on. Although they all seem different, they are members of the same category - dogs. We also seem to feel that some members of categories are more typical than others. For example, take the category RED. Imagine a true red. Now imagine an orangish red. Imagine purplish red. Although you might call the orangish or purplish red by the same name RED, they would not be as good examples of the category RED as the true red. In short, some reds are redder than others. In this study I would like you to decide how characteristic of a category various words and phrases are.

Try to use the whole scale in your ratings. By doing so a better reflection of the differences you perceive between poor descriptors and good descriptors will be ascertained. I suggest that you read through all of the descriptors once to get an overall idea of them; then, proceed with your ratings. Please keep in mind that participation in this study is voluntary and you may withdraw at any time.

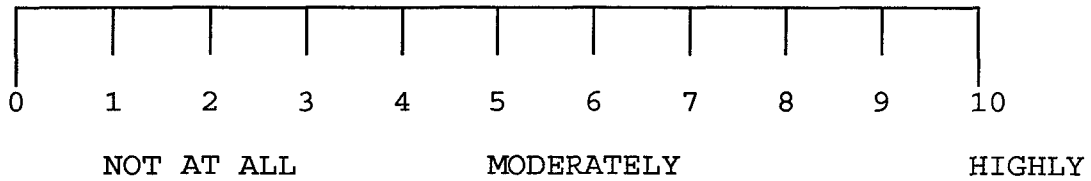
Thank-you for your cooperation.

AN EXAMPLE WITH FURNITURE. How typical are: chair, couch, table, ottoman, bookcase? Circle appropriate response on scale.

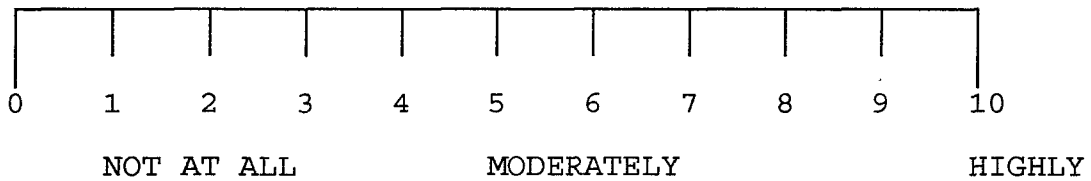


I would like you to do the same for a series of descriptors of "wise" teachers. Various descriptors will be presented and I would like you to rate them according to how typical you think they are of "wise" teachers. For example, wise teachers may be described as *courteous*, or *well-dressed*; how typical are these descriptors? Use the scale.

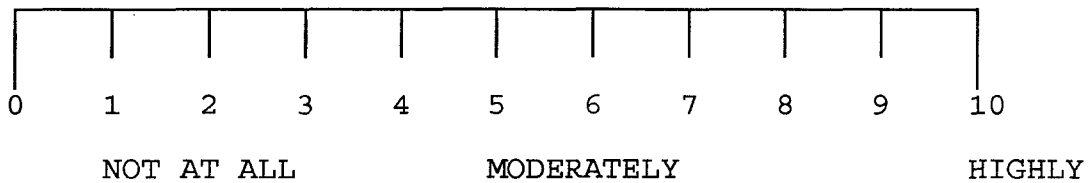
1. ORGANIZED, PREPARED



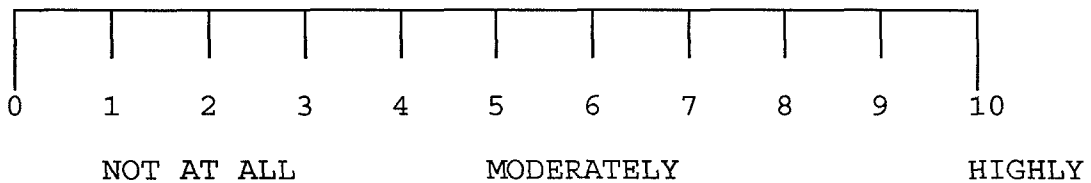
2. "WITH-IT", STREET-SMART



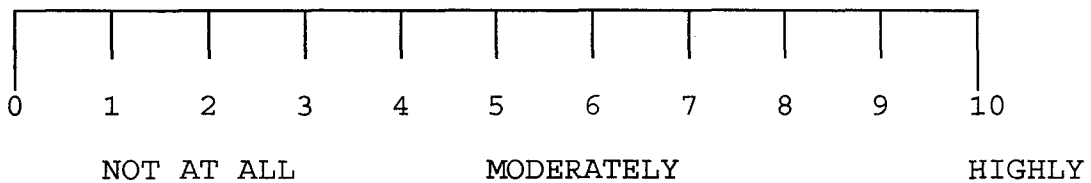
3. CLASSROOM AWARENESS, OBSERVANT



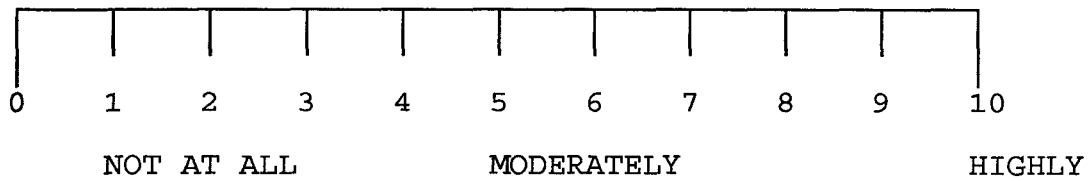
4. ACCOUNTABLE



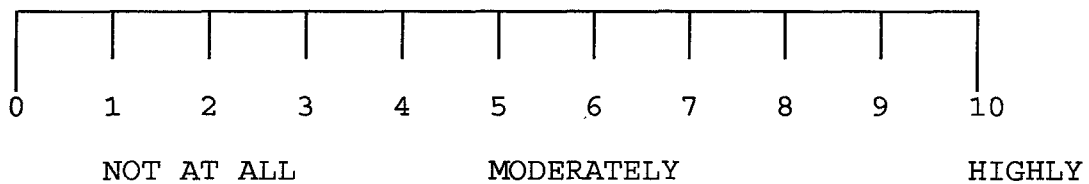
5. TEACHING RELATES TO STUDENTS' EXPERIENCES



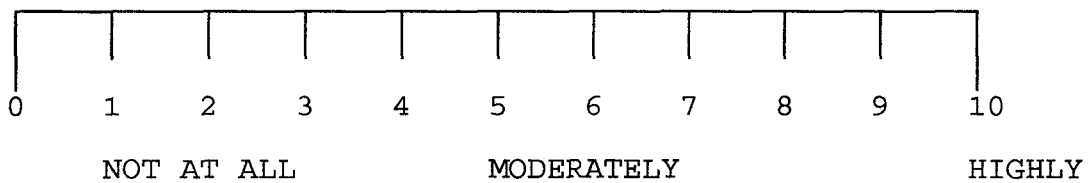
6. THOUGHT PROVOKING



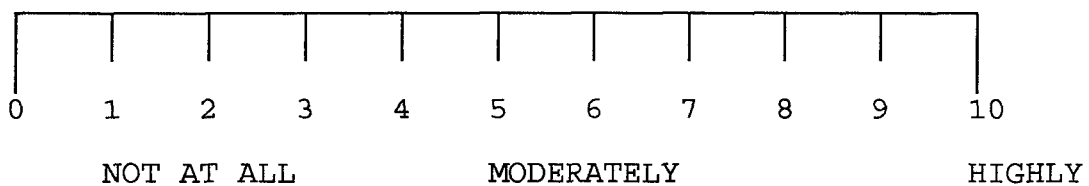
7. SENSE OF HUMOUR



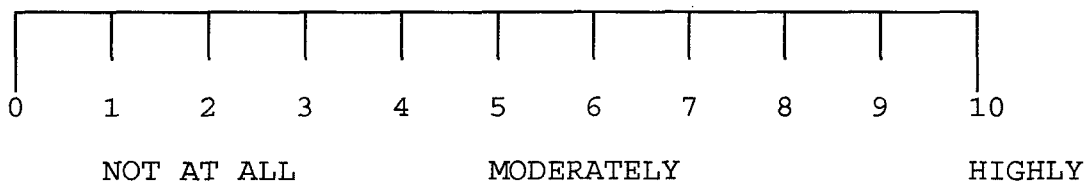
8. MAKES SOUND DECISIONS



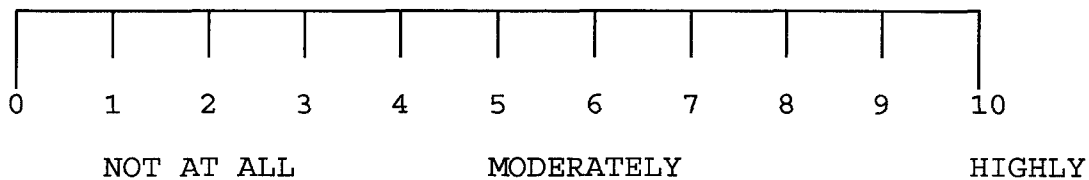
9. CALM



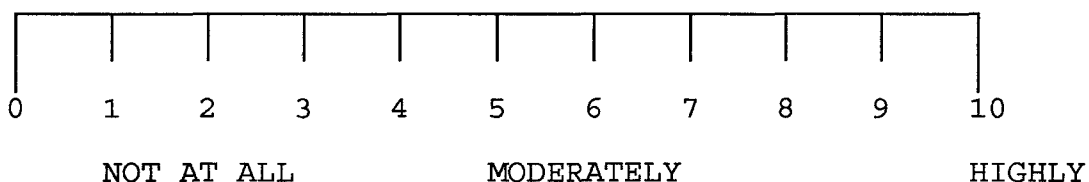
10. EXPERIENCED, EXPERIENCE WITH SUBJECT AREA



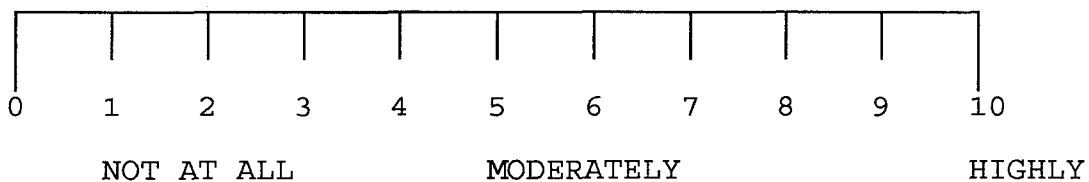
11. INTELLIGENT, GENERALLY KNOWLEDGEABLE



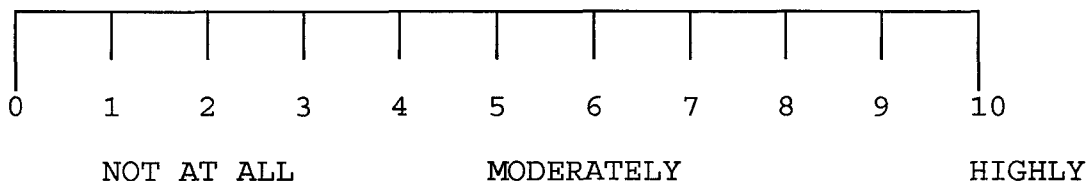
12. THOROUGH KNOWLEDGE OF SUBJECT AREA, KNOWS SUBJECT AREA VERY WELL



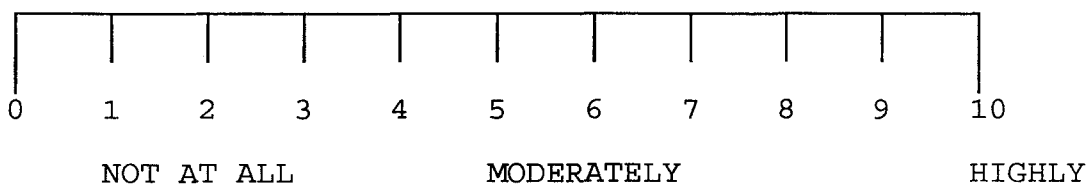
13. INTERESTED, INVOLVED



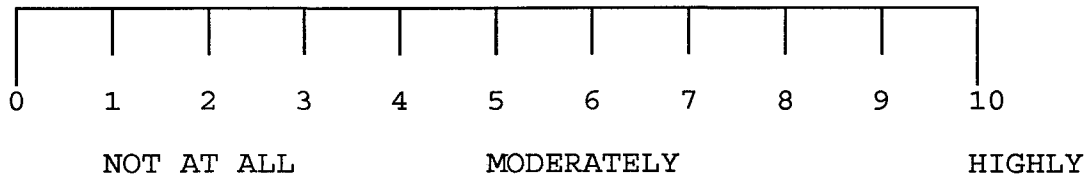
14. ENTHUSIASTIC



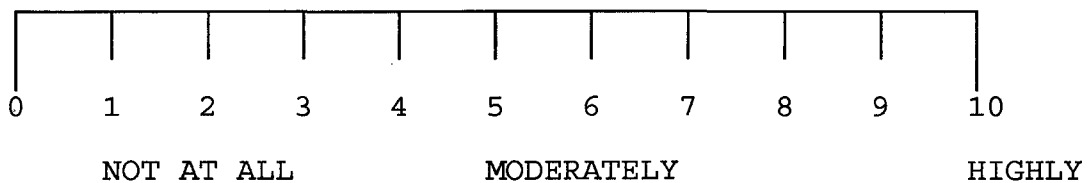
15. APPROACHABLE



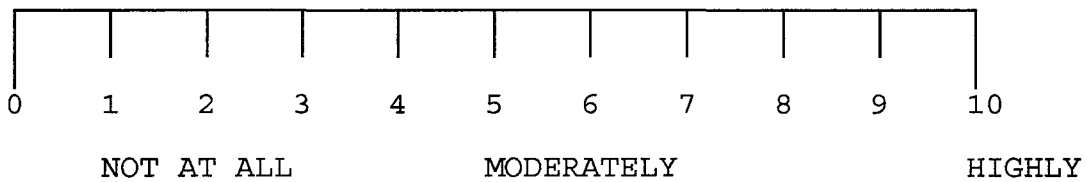
16. UNDERSTANDING, SHOWS EMPATHY



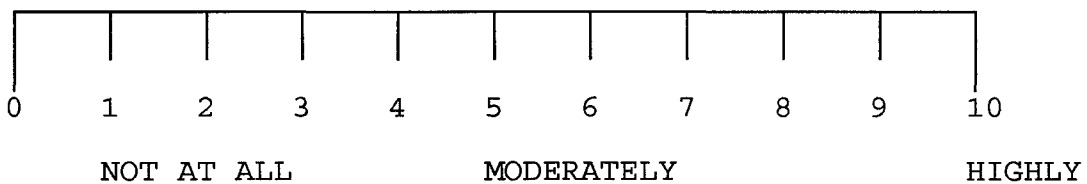
17. FAIR



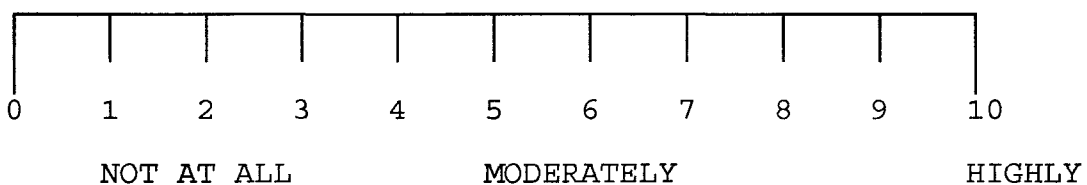
18. REFLECTIVE



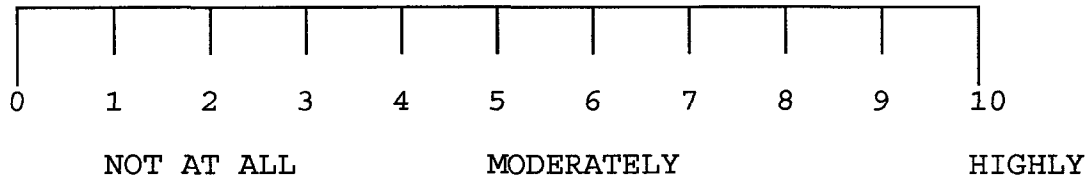
19. CREATIVE



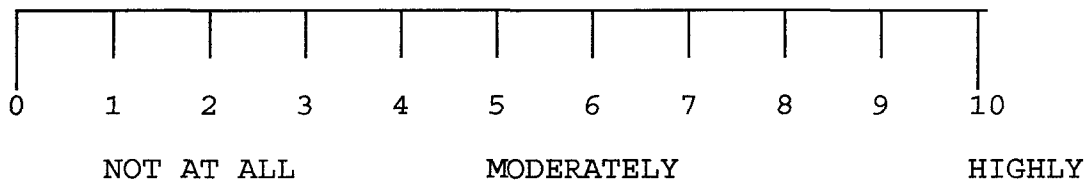
20. CARING



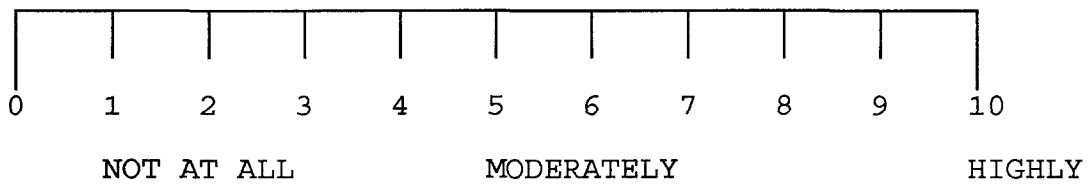
21. OPEN-MINDED



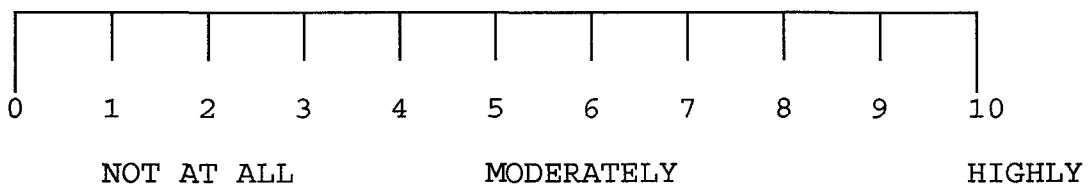
22. RECOGNIZES INDIVIDUAL DIFFERENCES OF STUDENTS



23. PATIENT



24. GENEROUS



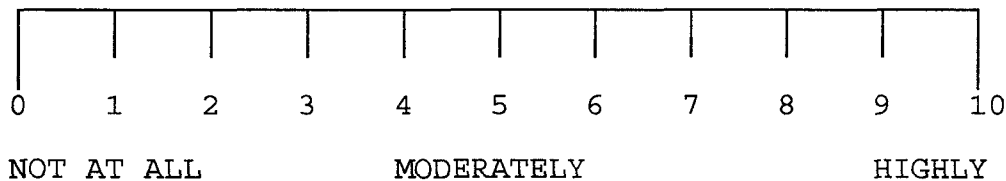
B. EXPERTISE IN TEACHING SCALE

This study has to with people's ideas about categories. A category is like a concept, and includes many instances of similar things, all of which share the same name, or label. For example, think of the category DOG. We can imagine many different kinds of dogs - poodles, terriers, German shepherds, and so on. Although they all seem different, they are members of the same category - dogs. We also seem to feel that some members of categories are more typical than others. For example, take the category RED. Imagine a true red. Now imagine an orangish red. Imagine purplish red. Although you might call the orangish or purplish red by the same name RED, they would not be as good examples of the category RED as the true red. In short, some reds are redder than others. In this study I would like you to decide how characteristic of a category various words and phrases are.

Try to use the whole scale in your ratings. By doing so a better reflection of the differences you perceive between poor descriptors and good descriptors will be ascertained. I suggest that you read through all of the descriptors once to get an overall idea of them; then, proceed with your ratings. Please keep in mind that participation in this study is voluntary and you may withdraw at any time.

Thank-you for your cooperation.

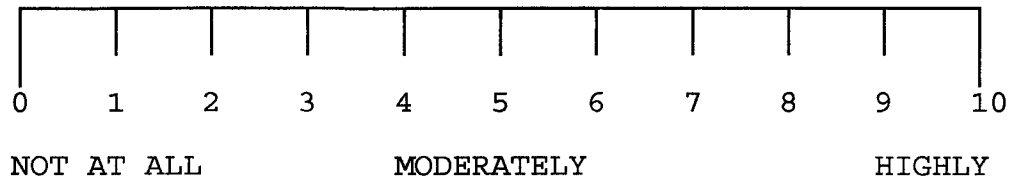
AN EXAMPLE WITH FURNITURE. How typical are: chair, couch, table, ottoman, bookcase? Circle appropriate response on scale.



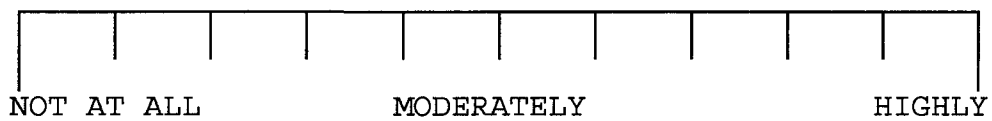
I would like you to do the same for a series of descriptors of "expert" teachers. Various descriptors will be presented and I would like you to rate them according to how typical YOU think they are of "expert" teachers. For example, expert teachers may be described as *courteous*, or *well-dressed*; how typical are these descriptors? Use the scale.

You may now proceed with the task, we will read through the descriptors once together.

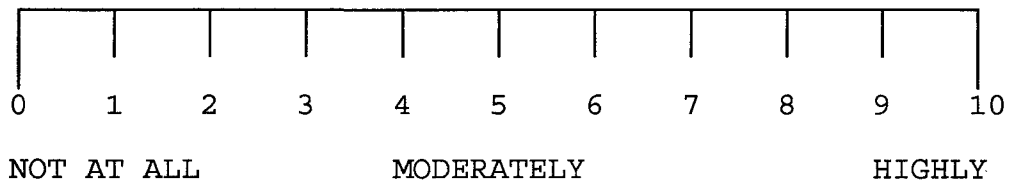
1. CONSISTENT, RELIABLE



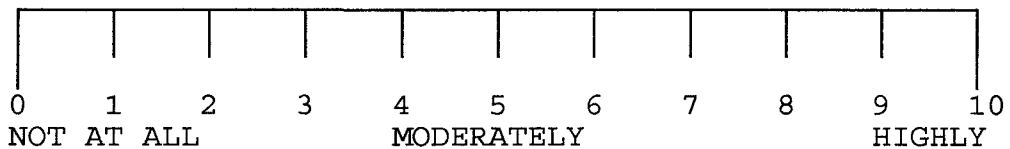
2. PROFESSIONAL, PROFICIENT



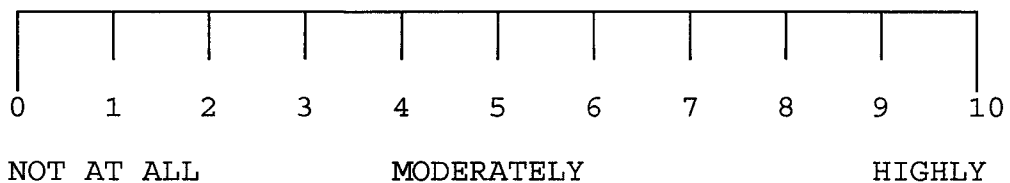
3. INTERESTED, INVOLVED



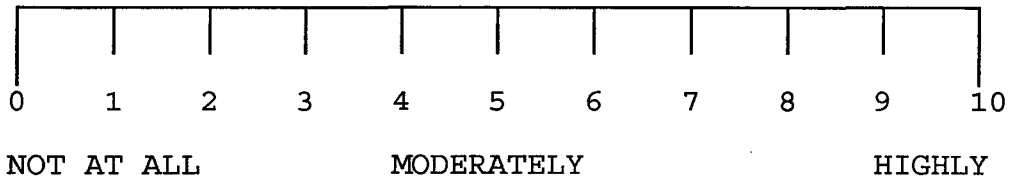
4. "WITH-IT", STREET SMART



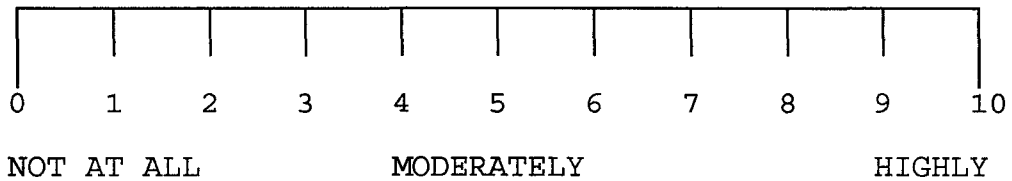
5. COMMUNICATES CLEARLY



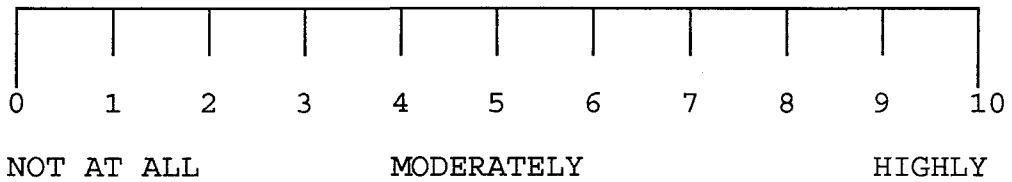
6. ENCOURAGING



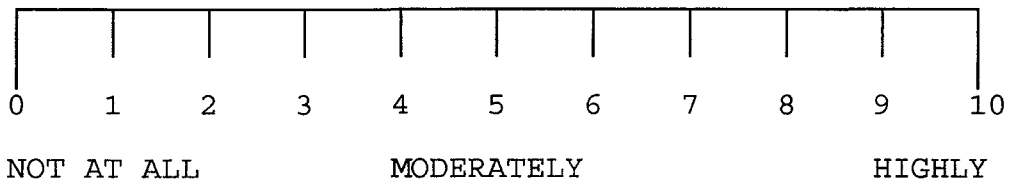
7. SENSE OF HUMOUR



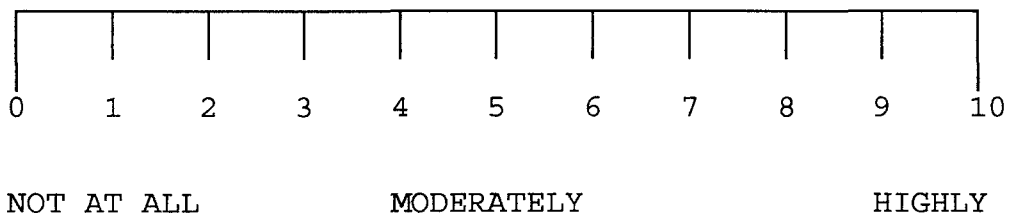
8. DISCIPLINED CLASSROOM MANAGER, GIFT FOR KEEPING STUDENTS ON TASK AND IN CONTROL



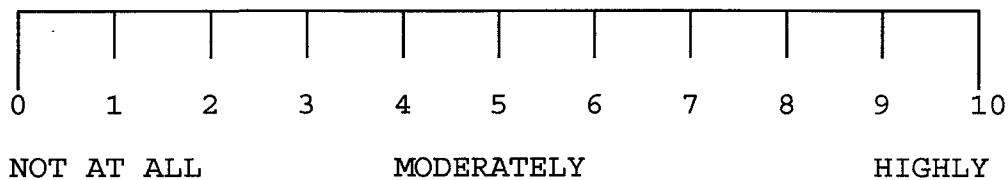
9. DEDICATED, COMMITTED



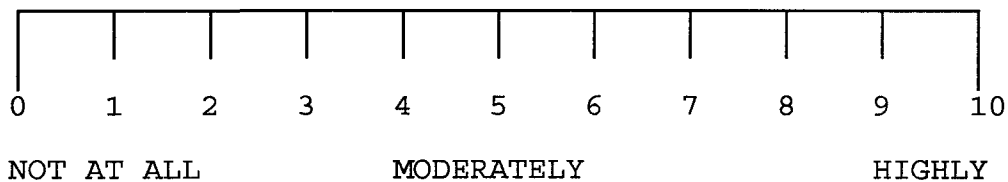
10. EXPERIENCED, EXPERIENCE WITH SUBJECT AREA



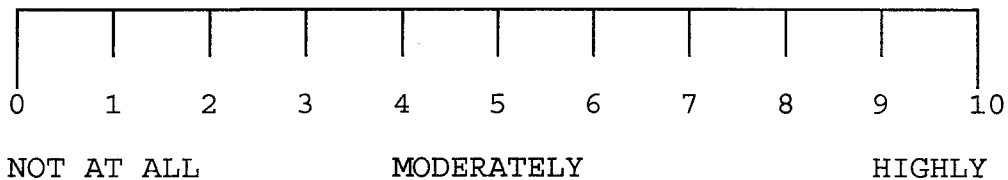
11. INTELLIGENT, GENERALLY KNOWLEDGEABLE



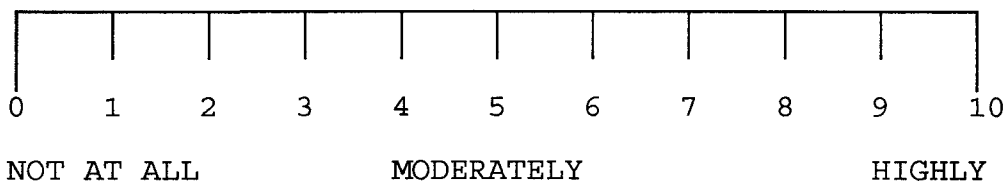
12. THOROUGH KNOWLEDGE OF SUBJECT AREA, KNOWS SUBJECT AREA VERY WELL



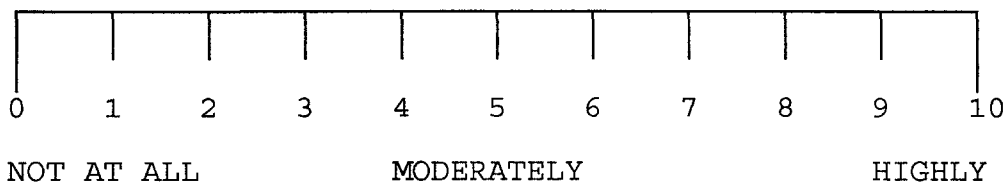
13. INTERESTING, LESSONS GRAB STUDENTS' ATTENTION



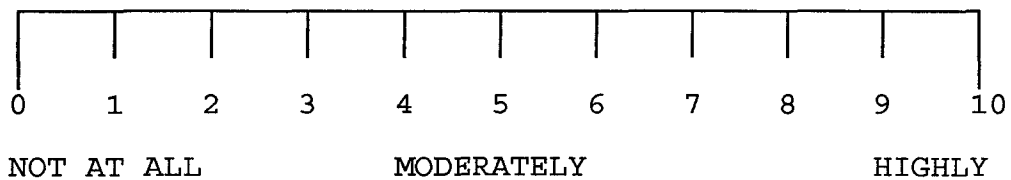
14. ENTHUSIASTIC



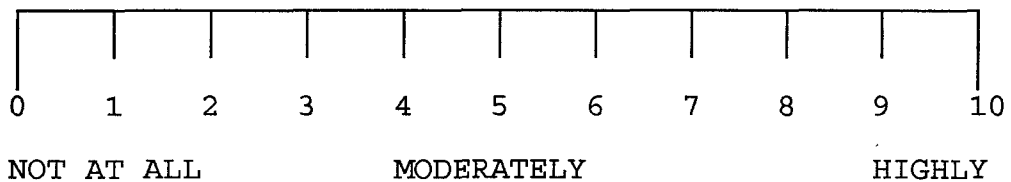
15. APPROACHABLE



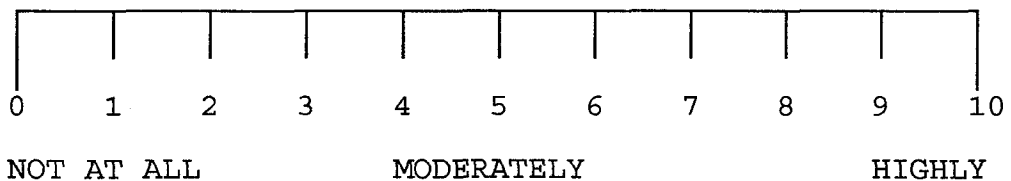
16. UNDERSTANDING, SHOWS EMPATHY



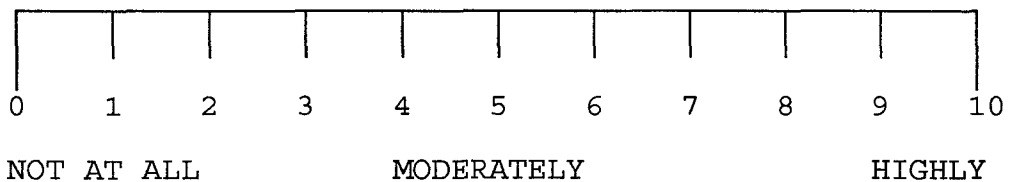
17. FAIR



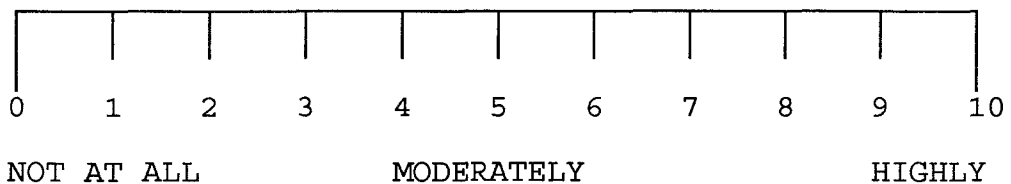
18. REFLECTIVE



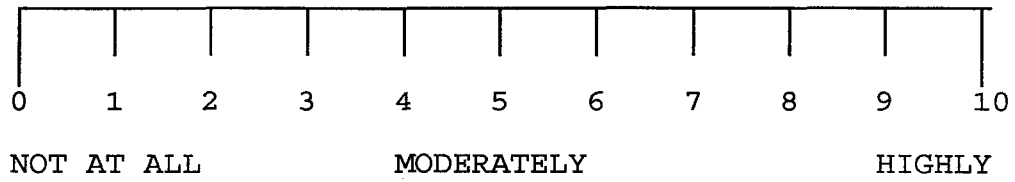
19. CREATIVE



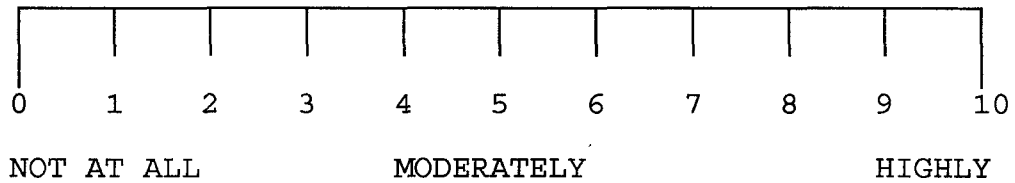
20. CARING



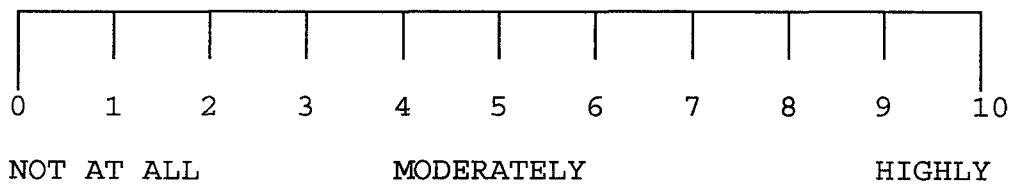
21. OPEN-MINDED



22. WILLING TO CHANGE OR EVOLVE



23. PATIENT



IX. APPENDIX C

A. CORRELATION MATRIX FOR THE WISDOM SCALE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-																							
2	.03	-																						
3	.33	-.04	-																					
4	.16	-.09	.33	-																				
5	.00	.11	.35	.03	-																			
6	.09	-.06	.01	.33	.23	-																		
7	.08	.10	.09	.24	.18	.24	-																	
8	-.09	.05	.16	.28	.28	.59	.10	-																
9	.03	-.10	.17	.43	.30	.38	.38	.20	-															
10	-.04	-.12	.12	.27	.32	.44	.07	.40	.36	-														
11	.03	.10	.17	.25	.33	.36	.25	.41	.21	.71	-													
12	.07	.06	.17	.26	.25	.33	-.07	.34	.25	.78	.65	-												
13	.14	.04	.28	.33	.18	.32	.39	.18	.41	.22	.21	.24	-											
14	.21	.07	.36	.39	.28	.32	.65	.08	.50	.14	.09	-.02	.67	-										
15	.14	.09	.22	.41	.26	.17	.57	-.11	.49	.06	.00	-.04	.50	.82	-									
16	.15	-.07	.28	.24	.37	.07	.53	-.06	.45	-.09	-.08	-.16	.41	.63	.76	-								
17	.10	-.13	.20	.09	.28	.20	.36	.17	.33	.18	.18	-.13	.22	.48	.48	.52	-							
18	.15	.24	.20	.29	.21	.22	.01	.18	.21	.15	.14	.23	.30	.24	.27	.14	.11	-						
19	.10	.11	.01	.18	.07	.15	.30	.05	.08	-.06	-.02	.01	.47	.45	.47	.41	.21	.35	-					
20	.26	.04	.48	.28	.36	.06	.43	-.03	.51	-.08	-.06	-.10	.42	.66	.76	.77	.45	.23	.29	-				
21	.00	.06	.17	.06	.17	.06	.35	.13	-.02	-.13	-.04	-.07	.44	.35	.37	.46	.27	.33	.59	.38	-			
22	.24	.15	.26	.16	.41	.23	.32	.14	.24	.06	.02	.05	.32	.46	.44	.41	.27	.31	.28	.34	.36	-		
23	.18	-.09	.28	.26	.40	.15	.45	.00	.55	.25	.10	.05	.37	.64	.68	.59	.61	.06	.22	.64	.27	.57	-	
24	.22	.15	.22	.39	.42	.31	.49	.26	.47	.26	.29	.25	.43	.51	.48	.49	.21	.38	.52	.44	.37	.48	.43	-

1 ORGANIZED
2 WITH-IT
3 OBSERVANT
4 ACCOUNTABLE
5 RELATES
6 PROVOKING

7 HUMOUR
8 SOU. DEC.
9 CALM
10 EXPERIENCED
11 INTELLIGENT
12 SUBJECT KNOW.

13 INTERESTS
14 ENTHUSIASTIC
15 APPROACHABLE
16 EMPATHY
17 FAIR
18 REFLECT.

19 CREATIVE
20 CARING
21 OPEN-MINDED
22 IND. DIFF'S
23 PATIENT
24 GENEROUS

B. CORRELATION MATRIX FOR THE EXPERTISE SCALE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	-																						
2	.03	-																					
3	.63	-.04	-																				
4	.16	.69	.13	-																			
5	.00	.11	.10	.03	-																		
6	.09	-.06	.01	.03	.07	-																	
7	.08	.10	.09	.04	.18	-.24	-																
8	-.09	.05	.16	.08	.05	.19	.10	-															
9	.03	-.10	.17	.13	-.09	.08	.11	.20	-														
10	.74	-.12	.62	.07	.05	.04	.07	.10	.16	-													
11	.67	.10	.77	.02	.01	.06	.25	.11	.11	.71	-												
12	.77	-.06	.55	.00	.25	-.03	-.07	-.14	-.05	.78	.65	-											
13	.14	.04	.18	.03	.66	.02	.19	.13	.21	.22	.21	.24	-										
14	.21	.07	.03	.08	.02	.03	.11	-.08	.50	.14	.09	-.02	.17	-									
15	.14	.05	.12	.07	-.03	.17	.07	-.11	.49	.06	.00	-.04	.20	.32	-								
16	.15	-.07	.18	.24	.08	.07	.03	-.06	.45	-.09	-.08	-.16	.11	.36	.56	-							
17	.10	-.13	.20	.09	.05	.20	.76	.17	.03	.18	.18	-.13	.02	.06	.08	.02	-						
18	.15	.24	.20	.21	.21	.22	.61	.18	-.05	.15	.14	.23	.20	-.08	.07	.14	.51	-					
19	.10	.11	.01	.18	.07	.15	.20	.05	.08	-.06	-.02	.01	.17	.05	.07	.21	.21	.15	-				
20	.26	.04	.08	.06	.07	.06	.03	-.03	.31	-.08	-.05	-.10	-.02	.46	.46	.47	.05	.23	.29	-			
21	.00	.04	.17	.06	.17	.06	.05	.13	-.02	-.13	-.02	-.07	-.04	.05	.07	.06	.27	.03	.09	.08	-		
22	.24	.15	.06	.16	.04	.23	.02	.14	.34	.06	.02	.05	.23	.46	.44	.41	.27	.21	.02	.34	.06	-	
23	.18	-.09	.08	.26	.00	.15	-.04	.00	.45	.25	.17	.05	.23	.44	.38	.39	.21	.06	.22	.44	.27	.47	-

1 PROFESSIONAL	7 HUMOUR	13 INTERESTED/INVOLVED	19 CREATIVE
2 WITH-IT	8 INTERESTING	14 ENTHUSIASTIC	20 CARING
3 DEDICATED	9 RELIABLE	15 APPROACHABLE	21 OPEN-MINDED
4 COMMUNICATES	10 EXPERIENCED	16 EMPATHY	22 ENCOURAGING
5 WILLING TO CHANGE	11 INTELLIGENT	17 FAIR	23 PATIENT
6 DISCIPLINED MANAGER	12 SUBJECT KNOW	18 REFLECT.	

C. ROTATED COMPONENT LOADING MATRIX FOR WISDOM SCALE

COMPONENTS

	1	2	3	4	5	6
APPROACHABLE	.88	-.05	.23	.13	-.02	.09
ENTHUSIASTIC	.82	.09	.30	.17	-.01	.00
PATIENT	.79	.09	-.03	.14	.32	-.10
EMPATHY	.78	-.18	.24	.13	.23	-.09
CARING	.75	-.14	.14	.38	.19	-.03
HUMOUR	.72	.10	.20	-.21	.00	.10
CALM	.68	.41	-.10	.09	-.09	-.09
FAIR	.55	.05	.09	-.04	.41	-.36
GENEROUS	.50	.34	.43	.16	.09	.24
INTEREST	.48	.25	.48	.17	-.14	-.01
EXPERIENCED	.11	.87	-.15	.01	.08	-.04
SUB KNOWLEDGE	-.08	.82	-.03	.20	-.03	.21
INTELLIGENT	.06	.80	-.05	-.01	.13	.14
SOUND DEC	-.12	.64	.36	-.07	.22	-.28
THOUGHT PROV	.17	.64	.31	-.09	-.05	-.26
OPEN MINDED	.23	-.15	.77	-.01	.26	-.05
CREATIVE	.31	-.05	.76	-.03	-.10	.12

REFLECTIVE	.03	.23	.55	.35	.02	.25
OBSERVANT	.17	.11	.05	.76	.29	-.15
ORGANIZED	.11	-.05	.04	.69	-.07	.08
RELATES	.27	.34	.04	.13	.72	.13
IND DIFF	.39	.06	.33	.23	.42	.16
ACCOUNTABLE	.35	.40	.18	.39	-.41	-.16
WITHIT	-.02	.01	.17	-.04	.11	.82

D. ROTATED COMPONENT LOADING MATRIX FOR EXPERTISE SCALE

COMPONENTS

	1	2	3	4	5	6	7	8
EXPERIENCE	.85	-.05	.13	.03	-.02	.71	-.09	.02
PROFESSIONAL	.81	.13	.07	.08	-.01	.00	-.11	-.01
DEDICATED	.80	.09	.06	-.03	.20	.14	.12	-.10
INTELLIGENT	.79	-.18	.24	.13	.34	-.09	.08	.06
THOR KNOWLEDGE	.62	.09	.05	-.04	-.07	.05	.00	.00
APPROACHABLE	.10	.70	.38	.00	.10	-.05	-.15	.03
CONSISTENT	.11	.61	-.10	.05	.33	-.01	-.06	.04
ENTHUSIASTIC	.05	.61	.19	.48	-.04	.41	-.36	.02
ENCOURAGING	.22	.58	.32	.40	.07	-.16	.09	.24
CARING	.51	.58	.25	.02	.28	-.04	-.14	-.01
PATIENT	.19	.49	.16	.08	-.09	-.22	.45	-.05
EMPATHY	.11	.49	.17	.45	-.15	.01	.28	-.14
HUMOUR	.08	.19	.87	-.03	.23	.10	-.07	.11
FAIR	.06	.16	.81	.23	-.05	-.01	.13	.14
REFLECTIVE	-.12	.51	.57	.36	.25	-.22	-.07	.22
EVOLVE	.15	.11	.04	.88	-.05	-.16	-.02	-.10
INTERESTED	.03	.02	.15	.25	.02	.76	.08	.58
DISCIPLINED	.22	.24	-.15	.17	.84	-.01	.26	-.05

CREATIVE	.22	.15	.40	.65	.33	-.19	.13	.35
COMMUNICATES	.05	.01	.01	.05	-.07	.02	-.87	-.06
WITH-IT	.21	.07	-.05	.18	.04	.31	.56	-.07
OPEN-MINDED	.17	.15	.03	.04	.20	.13	.87	-.13