EXPLORING TEACHING ASSISTANTS’
CONCEPTIONS OF TEACHING

By

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ABSTRACT

As academics interested in the improvement of post-secondary teaching, we are challenged to understand and articulate our differing conceptions of teaching. As a process of personal discovery, this can lead us to make our beliefs and actions more congruent, and thus ultimately to improve our practice. As a focus for research, it can provide us with a solid foundation from which to begin to understand and discuss the contrasting and often apparently conflicting beliefs and practices of others. As a goal for practitioners, meeting this challenge can suggest improvements to our teaching training programs which will help others to reach that goal.

This phenomenographical research, Exploring Teaching Assistants' Conceptions of Teaching, inquired into the conceptions of teaching held by nine teaching assistants, and identified changes in their conceptions over time.

Four qualitatively different conceptions of teaching were identified: (1) Communicating Content--Sharing Concepts, (2) Contextualizing Learning--Knowledge in Action, (3) Developing Scholars--Advancing a Discipline, and (4) Inspiring Learning--Honouring Curiosity. These conceptions were defined as unique profiles of seven constituent dimensions: (1) Learner Diversity, (2) Learner Autonomy, (3) Orientation of Learning, (4) Expected Outcomes of Learning, (5) Knowledge and Meaning, (6) Teaching-Learning Process, and (7) Focus of Teaching. Changes in the combinations of conceptions of teaching held by three of the TAs during the research period were identified.
No changes were identified in the combinations of conceptions held by the remaining six TAs.

This research showed that numerous similarities exist between the conceptions held by this group of TAs, and those identified by other researchers working with faculty members and adult educators. It confirmed that changes do occur in the combinations of conceptions held. Further, this research contributed methodologically to the study of beliefs about teaching, by demonstrating the benefits of using profiles of common constituent dimensions to define and compare conceptions. Finally, it identified gaps in our knowledge, suggested improvements to our practice, and highlighted areas worthy of more in-depth investigation which will contribute toward improving teaching in post-secondary education.
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CHAPTER ONE
INTRODUCTION

To teach, after all, is to engage in an ongoing effort to move others to learn to learn, to come to know, to think, to see. Most philosophies of teaching view this as a process, perhaps a self-correcting process, one that is itself educative without a pre-determined stopping place. For people to announce that they are teachers with nothing further to discover or to attain might well contradict what being a teacher means.

Maxine Greene
Philosophy and Teaching

Teaching is a word that we use to describe an aspect of the educational process. If we are teachers, teaching is something we do, an experience we have in our world. While aspects of my experience are likely to be similar to aspects of your experience, what teaching means to me--how I understand it, and what I believe about it--may be different from what it means to you. These different meanings influence how we plan and conduct our teaching, how we view the teaching of others, and how we understand learning and education.

In today's rapidly changing world, meeting the demand for better post-secondary educational services requires improvements in the way we teach (Smith, 1991). To deal with the knowledge explosion, we need to help students learn how to manage and utilize knowledge--to know how to find it and transform it for their use in efficient problem-solving--rather than trying, as many teachers have done in the past, to help them learn all there is to know in a discipline. New teaching technologies are constantly becoming available; those who do not know when, how and why to use them may hamper their
students' learning, and limit improvement of their teaching. Diversity among learners reflects the increasing diversity of our society; recognition of differences in learning styles calls for flexibility and adaptability from teachers. Improvements to our teaching are essential.

However, when people talk about teaching, one person frequently does not know what another means, even when the same words are used (Pratt, 1992). Before we can improve what we are doing as teachers, we must first be clear about what we mean when we talk about teaching. This entails comprehending the values and beliefs which underlie our conceptions of teaching, and their influences on our practice. Without such understanding, we have no starting point from which to develop. Changing what we do, without being committed to the values underlying the changes, is unlikely to lead to lasting improvement in our teaching.

As someone once said, "if we don’t know where we are now, how can we figure out where we’re going?" Yet our knowledge both of current conceptions of teaching and of how they change over time is limited. This research, Exploring Teaching Assistants’ Conceptions of Teaching, expands our current knowledge by inquiring into the conceptions of teaching held by a small group of teaching assistants, and by tracking how their conceptions changed during the research period.
Problem Statement

At North American universities, significant undergraduate teaching is done by graduate teaching assistants (Nyquist & Wulff, 1987; Smock & Menges, 1985). At the University of British Columbia, for example, approximately 1,600 teaching assistants teach some unknown number of the 21,000 undergraduate learners (personal communication, Peter Lane, CUPE representative, February 1993). In response to society's demand for improved teaching in post-secondary education (Boyer, 1990; Smith, 1991), educational institutions are placing increased emphasis on helping teaching assistants (Tas) improve their teaching (Andrews, 1985a, 1985b; Weimer, Svinicki & Bauer, 1989). The potential for improvement in post-secondary teaching from such programs is significant; many of the teaching assistants of today will be the college and university faculty of tomorrow.

However, just as the initial process-product research aimed at improving teaching emphasized one aspect of teaching, so today's teaching assistant training programs are, in many ways, focusing on one aspect of teaching (Andrews, 1985a, 1985b; Weimer, Svinicki & Bauer, 1989). That research was primarily concerned with identifying "effective ways of teaching" (Zahorik, 1987, p. 275), looking at the actions which a teacher could take (process) to improve her/his students' learning (product). Most teaching assistant training programs focus on logistics and actions, on "how to make a lesson plan, how to lecture or how to conduct a science lab." They seldom
begin by helping TAs articulate their current understandings of teaching, or by discussing the various conceptions of teaching and the impact of different beliefs on teaching practice. Yet the underlying assumption of today's research on teacher thinking is that "a teacher's cognitive and other behaviours are guided by and make sense in relation to a personally held system of beliefs, values and principles" (Clark & Peterson, 1986, p. 287).

To understand TAs' teaching, and to help them become better teachers, we and they must be aware of the implicit understandings of teaching on which their actions are based, and the relationship between beliefs and actions (Calderhead, 1987; Clark, 1988; Clark & Peterson, 1986; Pintrich, 1990; Sparks, 1988). Without this awareness, proposed changes to teaching behaviour which are at odds with TAs' beliefs are unlikely to be embraced or implemented with enthusiasm, thoroughness or persistence (Ernest, 1989; Hewson & Hewson, 1989; Lester & Mayher, 1987; Pratt, 1992; Sparks, 1988). For example, a recommendation that a TA include more opportunity for learner participation in her/his seminars, when the TA's mental image of effective teaching is presentation of material by the teacher as "the expert," is unlikely to be perceived as a recommendation worth implementing. Pintrich (1990) has noted that research on adolescent and adult thinking "suggests that teachers' epistemological and metaphysical beliefs about the nature of inquiry, the construction of new knowledge, and judgements about reality . . . can influence what and how they learn from teacher education courses and professional-
development seminars" (p. 849). Our ability to help TAs develop as teachers is hindered by our limited understanding of their initial beliefs about teaching, and of how these beliefs change over time.

Research Purpose

In this research, I inquired into the understandings of teaching held by a small group of teaching assistants, to discover whether and in what ways their conceptions of teaching changed: (1) after participating in a teaching training program; and (2) after they had subsequently taught for a time in a specific context, when they might or might not have applied what they had learned. The research explored and classified their initial understandings of teaching, explicit or implicit, using both a standard phenomenographic approach and a refinement to that approach which provided a formalized coding system to define conceptions. Following the initial classification, the research identified changes in the TAs' expressed beliefs about teaching. These changes were used to develop "snapshots" of their conceptions as they existed at three points during a three month period. No attempt was made to attribute the changes identified to participation in the training programs or in this research project. Program evaluation was not the objective, since these programs, as with most TA training, focused primarily on changing teaching actions, while my interest is in teachers' beliefs. The goal was, rather, to discover and categorize the initial conceptions
of teaching held by these teaching assistants, to portray the changes which occurred in their beliefs during this period, and to test the modified phenomenographic methodology.

This exploration provides teaching assistants, faculty members, faculty developers, and educational institution administrators with information about how some teaching assistants understand teaching. It provides a different perspective from that often used for discussing programs aimed at improving teaching, going beneath superficial behavioural changes to look at beliefs about teaching, and the relationship of such beliefs to practice. It also provides researchers with a formalized coding system which helps to delimit the boundaries of the conceptions, and to compare conceptions characterized by other researchers.

Background to this Research

Three major issues influenced the development of this research:

1. The contradiction between the current research focus on teachers' thought structures, in particular the relationship of beliefs and values to actions, and the emphasis in many teaching assistant training programs on simply making changes in teaching behaviours;

2. Our pressing need, in the effort to improve post-secondary teaching, for more knowledge about
conceptions of teaching, how they change, and their relationship to teacher development; and

3. The gap in our knowledge of conceptions when it comes to teaching assistants, the faculty members of the future.

Research on Teacher Thought Structures:

Training for Teaching Actions

Teachers' thought structures are the "permanent but ever-changing and growing body of knowledge, beliefs and attitudes stored in the mind of the teacher as schemas" (Ernest, 1989, p. 15). In the context of research on teacher thinking, they are differentiated from the fluid thought processes of planning, interactive decision-making, and reflection, although the two are integrally related in practice (Ernest, 1989; Nisbett & Ross, 1980). Thought structures are the sources of and provide the basis for thought processes, which lead to actions. The development of thought structures, whether occurring through incremental fine-tuning, or through more radical restructuring, originates from the operation of thought processes (Clarke & Lampert, 1986; MacLeod & McIntyre, 1977; Yorke, 1987).

For many who teach, the belief aspects of their thought structures about teaching are implicit and taken-for-granted. Yet these beliefs—implicit or explicit—influence their plans and actions, and thus their development as teachers (Calderhead, 1987; Clark & Peterson, 1986; Ernest, 1989; Holt & Johnston, 1989; Munby, 1982). Recent research on teacher thought structures has focused on making explicit these

At the same time, designers of teaching assistant training programs have been facing issues of on-going concern since 1930 (Nyquist, Abbott & Wulff, 1989a; Weimer, Svinicki, & Bauer, 1989). Those significant to this research include:

* What should be the training program requirements and curricula?

* What sorts of follow-up activities should be offered?

A recent survey of fourteen American universities conducting TA training programs identified teaching methods (actions) and subject matter content as the two primary areas of curricula required for TA training (Weimer, Svinicki, & Bauer, 1989). This would appear to be based on the assumption that behaviours in the tutorial, seminar, class, or office consultation adequately reflect the act of teaching. Such an assumption omits consideration of the meaning and intent of the actions which are undertaken (Kagan, 1988; Pratt, 1992). Yet the report of the survey responses does not mention that these training programs either recognized the relationship of TAs’ existing beliefs and conceptions to their learning, or provided opportunities to TAs to reflect on conceptions of teaching.

Perhaps not surprisingly, an area of TA training where philosophy and purpose of education (not teaching as such) are
part of the curricula is in international TA training programs (Constantinides, 1989). However, the objective is solely to help international TAs understand and practice accepted and expected classroom behaviour in American culture. The notion that there may be more than one conception of teaching held by American teachers, and that these conceptions may both influence and help to explain differences in their teaching actions, is not considered.

Andrews' (1985a) discussion of the need for instructional innovation in TA training identified three core TA functions--facilitating interactive learning, coaching in the higher level thinking skills, and providing a communication channel to integrate the course--and recommended two major resources for helping TAs carry out these functions successfully. His recommendations were the provision of "a simple but complete planning system" and "a toolbox of classroom activities" (p. 49) which could be used by the TA--both methods ("how to") recommendations. While Andrews recognizes that successful performance of these functions requires TAs to learn new conceptions of the teaching role, as well as new communication skills, he does not acknowledge the role of TA beliefs in acceptance and implementation of innovation in teaching practice.

The importance of thought structures and their belief aspects in changing teaching actions has been emerging in the research literature for some time. "Change in practice depends upon change in belief. They wanted to effect these changes because their beliefs had changed" (Lester & Mayher, 1987, p.
The irony is that TA training programs continue primarily to teach various methods and activities--often designed to increase learner participation--which are unfamiliar to TAs who learned to teach by watching first their teachers and then their professors lecture (Cuban, 1984; Pickering, 1988). Often, the beliefs underlying recommended changes in practice may be in conflict with beliefs about teaching which TAs hold, yet those who sponsor and conduct such programs assume that TAs will make changes for the better in their teaching practices as a result of attending these programs. Unfortunately, while most training programs record "participant satisfaction data," little empirical research looks at changes in TAs' practice following attendance, much less relates successful behavioural innovations to changes in their beliefs (Abbott, Wulff & Szego, 1989; Carroll, 1980; Levinson-Rose & Menges, 1981). We do not know how successful training programs are in helping TAs improve their teaching. We do know from research that changes in practice are related to the belief aspects of thought structures, and that these programs do not explicitly recognize and help TAs understand and use that relationship.

Why We Need to Know More about Conceptions and How They Change

Pressure for reforms in post-secondary teaching and those promoting teaching training programs for teaching assistants and faculty overlook a basic factor: the importance of the psychological foundations of the practice of teaching--teachers' thought structures (schemas) and thought processes.
In thinking about conceptions, we are concerned with the belief aspects of thought structures and their relationship to thought processes and subsequent actions in practice.

As discussed above, beliefs--implicit or explicit--form one aspect of the basis for teaching actions. In the context of improving post-secondary teaching, individually and institutionally, we will derive some important benefits from increasing our knowledge of the beliefs about teaching we hold as faculty and teaching assistants.

First, whether initiated individually or organizationally, attempts to change teaching actions without consideration of the relationship between the actions and their underlying beliefs or values can lead to contradictory and inconsistent teaching behaviour (Zahorik, 1977). We often assume that if research shows one behaviour is more successful than another in helping students learn, teachers will choose to use the more effective action in their teaching. But this assumption does not take into account the fact that research findings, like other knowledge we gain and experiences we have, are filtered through and given meaning by our thought structures before they influence our actions. Knowledge of our conceptions of teaching allows us to choose alternative teaching actions which are compatible with our beliefs and with our other teaching behaviours.

Second, beliefs and values provide us with guidance for making decisions about our teaching behaviour (Zahorik, 1977). Those actions which are compatible with our beliefs and our other teaching behaviours are those to which we are committed.
by our belief in them. Commitment in turn means that we employ them with greater fervour, and consequently with greater effectiveness (Zahorik, 1978), thus improving our teaching.

Third, proposals for fundamental changes in curriculum often founder between their conception by reformers, and their implementation by faculty and teaching assistants (Elliot, 1976). The chances of successful change improve when members of both groups can clearly articulate and understand the beliefs underlying the proposals and those underlying current teaching practice, and critically reflect on the issues involved.

Fourth, the influence of conceptions of teaching in teaching training programs is as important as it is in the process of curricular change (Calderhead & Robson, 1991; Hollingsworth, 1989; Holt & Johnston, 1989; Martin & Balla, 1991; Zeichner, 1983). For us as teachers to make lasting changes in our teaching actions, the proposed changes must be compatible with our beliefs about teaching. Thus, teaching training programs must provide opportunities for discussion of different conceptions of teaching, for reflection on beliefs and values about teaching, and for consideration of the relationship between conceptions and actions.

Finally, differences in conceptions of teaching are often the basis of misunderstandings and even major disagreements among those involved in education—teachers, learners, administrators and policy-makers. Those who can recognize and sensitively discuss others' conceptions of teaching are in a much better position to resolve such misunderstandings.
What do we currently know about conceptions of teaching? While the focus of much of the research has been on student, novice and experienced teachers within the school system, some work has examined aspects of the conceptions of teaching held by those who teach in post-secondary education (Dall'Alba, 1991; Fox, 1983; Larsson, 1983, 1984; Martin & Balla, 1991; Menges & Rando, 1989; Pratt, 1990, 1992; Samuelowicz & Bain, 1992). In most of this research, regardless of teaching context, the researchers believe that identifying different conceptions of teaching will assist teachers in moving from implicit and privately held belief systems to explicit descriptions of their cognitive frames of reference. Different understandings of teacher, learner, content, context, and the aims of education, and the various interrelationships possible among these elements, distinguish the different conceptions identified. Beliefs about both the elements and their interrelationships are seen as influencing a teacher's thought processes and actions.

A common underlying assumption in much of the research is that consideration and reflection on one's implicit theories and beliefs, and progress toward making them explicit, often promotes movement from one conception to another. Research has produced some evidence to support this assumption (Clark & Peterson, 1986; Fox, 1983; Holt & Johnston, 1989; Menges & Rando, 1989; Richardson, Anders, Tidwell & Lloyd, 1991). This movement may be developmental and related to improvements in an individual's teaching over time, as that individual gains experience, participates in training programs and/or develops

Some researchers see different conceptions as being specifically valuable in different contexts, depending on the circumstances—social, psychological and/or institutional—within which a teacher is working (Clark & Peterson, 1986; Fox, 1983; Pratt, 1990, 1992). Others consider that conceptions may be context-dependent (Samuelowicz & Bain, 1992; Yaakobi & Sharan, 1985).

Most research done in the post-secondary context has been with faculty members (Dall’Alba, 1991; Fox, 1983; Martin & Balla, 1991; Samuelowicz & Bain, 1992). Some has looked at adult educators (Larsson, 1983, 1984; Pratt, 1990, 1992). Little research has considered teaching assistants (Menges & Rando, 1989).

It is unclear how many qualitatively different conceptions exist, and how they vary by context. While Pratt (1992) found five in his study, and most of those identified in other studies appear to belong to somewhat similar categories, the number of respondents is limited and there is a lack of detailed information about how the categories were established in many of the studies. Is there a limited number of qualitatively different conceptions of teaching? If so, how
can the different conceptions, identified in various studies, be defined and compared?

Longitudinal work on the differences in the beliefs of teachers throughout their professional careers is also needed. We do not currently have much information on how teachers' implicit theories and beliefs change over time and/or as they are made more explicit. Is there a developmental sequence involved in progress through different conceptions? If so, what is the relationship between conceptions, and how and when do changes in conceptions occur?

**Teaching Assistants--Faculty Members of the Future**

While some TAs view their jobs as "the apprenticeship to a lifelong career," others see it more prosaically as "a convenient way for the university to disburse financial aid" (Boehrer & Sarkisian, 1985, p. 7). TAs are often the people at a university who care most about teaching, desiring "to do well at what they have spent years criticizing others for doing poorly" (Boehrer & Sarkisian, 1985, p. 10). They do a significant amount of undergraduate teaching, and will continue to do so, given a continuing tight economic situation. While all TAs will not become faculty members, most faculty members have been TAs, and in the United States alone, 500,000 new faculty members will be needed by 2014 (Nyquist, Abbott & Wulff, 1989b).

While we know something about the conceptions of teaching held by student, novice and experienced teachers, including some who teach in post-secondary settings, we know little about
the conceptions held by TAs. An extensive review of recent research concerning beliefs about teaching found only one study which examined the conceptions of TAs. Menges & Rando (1989) looked at the implicit theories of teaching held by twenty TAs at a mid-western U.S. university at one point in time.

Given the importance of TAs for the future of post-secondary teaching, significantly more knowledge is needed about the conceptions of teaching they hold, and how these conceptions change. Do TAs go through a developmental process in their understandings of teaching? How important to their growth as teachers is the context in which they teach and think about and discuss their teaching? How do their experiences influence their beliefs? Do their conceptions change over time? Developing meaningful answers to these and other questions requires us to broaden and deepen our understandings of the belief aspects of the thought structures of teaching among TAs.

Research Questions

This research is exploratory and by necessity descriptive, since it comes from an attitude of informed exploration, rather than emerging from specified, preconceived hypotheses, or relying on a priori theory. My goal was to explore the initial conceptions of teaching, explicit or implicit, held by a small group of TAs, and to identify changes in those conceptions.
A number of research questions were developed to provide a framework for the discovery of the teaching assistants' conceptions, and the exploration of how their conceptions changed:

1. What do teaching assistants believe teaching is?
2. What are the metaphors for teaching used by teaching assistants?
3. Do teaching assistants have principles or sets of convictions which guide their teaching? If so, what are they?
4. How do teaching assistants conceive of themselves as teachers?
5. What do teaching assistants consider to be successful teaching?
6. How do teaching assistants see themselves as having changed as teachers since they began teaching?
7. What do teaching assistants consider learning to be?
8. What are the contexts within which teaching assistants teach? What impact does the context have on their teaching?
9. What do teaching assistants consider the role(s) of a teacher to be?
10. What do teaching assistants consider the students' role(s) to be? What is important to teaching assistants about their students?
11. How do teaching assistants view the importance of subject matter content in the teaching-learning situation?
I used these questions to guide my thinking in two areas in the research: (a) as a basis from which to derive interview questions, and (b) as lenses for focusing on the belief aspects of teacher thought structures in beginning the initial data analysis.

Definitions

To look at the meaning of terms and the difference between them is to define them. As Courtney (1989) states, the extent to which terms can be clearly defined, and therefore used (their workability), depends on "the extent to which the phenomena they describe are clearly bounded, standardized, or codified" (p. 23). Concepts in the social sciences frequently lack precision and rigid boundaries, and thus, to be understood and used clearly in specific instances, must be defined in each case. The definitions used in this study are synthesized from current literature on teaching, teacher thinking and phenomenography, and are introduced at the appropriate places in the forthcoming chapters. A glossary of terms is included as Appendix G.

Summary

Improvements in the way we teach in post-secondary education are essential (Smith, 1991). Yet we often do not understand each other's connotations when we talk about teaching, although we believe that our words carry the same meanings. Before we can improve what we are doing as teachers,
we need to understand the different beliefs and values underlying our conceptions of teaching. Changing what we do, without being committed to the values underlying the changes, is unlikely to lead to lasting improvement in our teaching.

To date, the limited research into conceptions of teaching in post-secondary education has focused on the conceptions held by faculty members and adult educators, while virtually ignoring the conceptions held by teaching assistants, the faculty members of the future. Little is known about how conceptions of teaching change over time, among teachers working in any educational context.

This research, Exploring Teaching Assistants' Conceptions of Teaching, inquires into the conceptions of teaching held by a small group of teaching assistants, and identifies changes in their conceptions over time.
CHAPTER TWO

CONTEXERE--WEAVING TOGETHER MEANINGFUL STRANDS:
A SELECTED REVIEW OF THE LITERATURE

Growth and development [as teachers] come from deep understanding of teaching and learning, rather than from slavish imitations of former teachers, reliance on innate ability, or conformity to prescribed rules.

Robert J. Menges
Marilla D. Svinicki
College teaching: From theory to practice

In this chapter, I set the context for this research by beginning to "weave together meaningful strands" found in a selected review of the literature. These strands consist of three issues relevant to improving our understanding of teaching assistants’ beliefs about teaching, and changes in their beliefs:

- teaching assistants and their teaching context;
- the psychological foundations of teaching—thought structures and thought processes—and their relationships to teaching actions; and
- recent research examining beliefs, and changes in beliefs, about teaching.

Definitions for terms used in this research are included as part of the summaries of each of these sections. I conclude the chapter with a preliminary framework, developed from the literature, for differentiating beliefs about teaching. This framework provides a basis against which to compare the
Teaching Assistants and Their Teaching Context

Teaching assistants are graduate students who assist faculty members with their teaching responsibilities. Depending on the university department to which the teaching assistants belong, they may be responsible for: (1) the entire presentation of a first or second year undergraduate course with a set curriculum and textbook, including planning, teaching, conducting office hours, and marking of student assignments; (2) the planning, teaching, and marking of assignments for a discussion group, laboratory section, or tutorial once per week; or (3) marking of all assignments given by the faculty member teaching the course, with no specific teaching responsibilities.

A teaching assistant is simultaneously both a graduate student and a teacher. The complexity of this dual role is heightened and made unique because it is transitional. "There is no permanence in the TA role; no one ever had a career as a TA" (Staton & Darling, 1989, p. 15). This is true whether TAs view being a TA as an apprenticeship to the professoriate, or simply as a means of temporary financial support while they finish their degrees.
Good at Learning, Good at Teaching?

Graduate teaching assistants are often chosen for their positions because they are good at learning: frequently they are outstanding students (Staton & Darling, 1989). Their departments see teaching assistantships as a way to support impecunious graduate students, while ensuring sufficient teaching staff for their undergraduate courses. It does not logically follow, however, that graduate students who are good at learning will be good at teaching. Indeed, "success in one [role] can even detract from success in the other" (Staton & Darling, 1989, p. 15).

Conflicting Priorities

Teaching assistants juggle seriously conflicting priorities to meet the requirements of their dual roles. The majority want to complete their graduate degrees within a reasonable time, and either enter the workforce, or continue further graduate study. To do this, they must focus their efforts on their course work and research. Yet to be an effective teacher also demands significant time and energy. Resolving these conflicting demands on their time is a constant balancing act.

A further issue is that their contracts with the university as teaching assistants, and any scholarship or fellowship funding they have, restricts the time they are able to spend away from their studies. At the University of British Columbia, for example, the current limit is twelve hours per week (University of British Columbia, 1992). After teaching,
conducting office hours and marking, little time is left. Most TAs spend this limited time planning and/or reflecting on their teaching actions in the class, seminar, or laboratory. They seldom have time for much else.

Learning How to Teach

Despite the recent increase in teaching training programs for teaching assistants (Weimer, Svinicki & Bauer, 1989), many TAs in North America receive limited, if any, formal training in teaching (McGill, Shaeffer & Menges, 1984; Nyquist, Abbott & Wulff, 1989b). How then, do they learn how to teach? Traditionally, the answer to this question has focused on role models (Calderhead & Robson, 1991; Feiman-Nemser & Floden, 1986; Goodman, 1988; Sprague & Nyquist, 1989), and the view that teaching assistants learn to teach "primarily by emulating the teachers they have admired" (McGill, Shaeffer & Menges, 1984, p. 256). However, McGill, Shaeffer & Menges (1984) have shown that how TAs teach is also based, in part, on their application of skills learned in settings related to, but not identical with, teaching. Examples include leading small groups, tutoring, performing on stage, counselling, editing, coaching, managing a retail operation and working in customer service. TAs learn to teach from many role models, not all of them teachers, in many contexts.

When training is available, most TAs with an opportunity to attend formal training programs are like other beginning teachers--they want to learn the 'how tos,' the survival skills needed to make it through that first class, term and year
successfully (McKeachie, 1986; Zahorik, 1986). Further, they want to learn these skills while spending the minimum time possible away from their research. In many ways, what today's teaching assistant training programs provide is what TAs want, at least initially: teaching techniques and methods.

However, as discussed in Chapter 1, what teachers do when they teach is only one aspect of teaching. Focusing on actions alone ignores their meaning and intent—the beliefs about teaching and learning on which the actions are based, and the original purpose behind the actions (Pratt, 1992), which may differ from what is eventually accomplished. When we do this, we fall into Eisner's (1982) fallacy of concreteness, which assumes that the act of teaching is adequately reflected in the observable behaviour of the participants. This neglects the meaning and intent perceived by teachers and students. (Kagan, 1988, p. 497)

Further, focusing on actions alone, without considering the related thought structures and thought processes which are influenced by context, ignores the effect of the context on actions.

To help TAs improve their teaching, we must learn more about and help TAs understand more about the three aspects of teaching: (1) their thought structures—the knowledge, beliefs and attitudes on which their thinking and teaching is based; (2) their thought processes—the planning (intentions), interactive decision-making, and reflection which occurs before, during, and after teaching, and from which arise changes in their permanent thought structures; and (3) the actions of teaching—what teachers do with and for their
learners. In the practice of teaching, none of these aspects operates in isolation: all are integrally related. Changes and experiences influencing one affect the others (Hewson & Hewson, 1989).

Teaching assistants appear to have tentative, multiple and sometimes conflicting beliefs and philosophies about teaching (McGill, Shaeffer & Menges, 1984; Menges & Rando, 1989). It is "a time of uncertainty about values, assumptions and techniques" (McGill, Shaeffer, & Menges, 1984). In this respect, they are similar to most student teachers, who may "have yet to discover their educational values and beliefs" (Zahorik, 1986, p. 23), or who may hold "multiple metaphors and images, some of which undoubtedly are contradictory and result in unclear visions of teaching and of self as teacher and inconsistent teaching behaviour" (Bullough & Knowles, 1991). If we are to help them clarify and become committed to some beliefs, thus developing consistency and congruency in their teaching actions and improving their teaching, we must know what prior beliefs about teaching they bring to the teaching situation. Knowing where they are starting from is an essential element in such a clarification process, aiming as it does "to make visible what is presumed in the formulation of purposes and aims" (Greene, 1986, p. 479). We cannot deeply understand our teaching without understanding the belief aspects of our thought structures.
Summary and Definitions

Teaching assistants are graduate students working on either a masters degree or a doctorate, in a university department which has a graduate program. They are also employees of the university who are reimbursed for their work as departmental teaching assistants. This work varies by department and by teaching assistant position, but may include responsibility for: (1) the planning, teaching, marking, etc. for an entire undergraduate course which may meet up to five hours per week; (2) the planning, teaching, and marking for a tutorial, discussion group, or laboratory session, which may meet once per week, or once every two weeks; or (3) marking all assignments for a particular course for which a faculty member is responsible for all other duties.

Although they are good at learning, teaching assistant may or may not be good at teaching. They struggle with the conflicting priorities of being both student and teacher.

Most TAs learn to teach informally, from observations of their teachers over the years, and by applying skills which they have learned in other settings to the process of teaching.

The Psychological Foundations of Teaching:

Their Relationship to Teaching Actions

Research on the psychological aspects of teaching is relatively new, although there is now a substantial volume of work in this area (Calderhead, 1987; Clark & Peterson, 1986; Mitchell & Marland, 1989). Much of this research has focused
on the general thought processes of teachers (Clark & Peterson, 1986; Munby, 1982; Shavelson & Stern, 1981), in contrast to their knowledge, beliefs, and attitudes, although this is changing somewhat (Ernest, 1989; Hewson & Hewson, 1989; Pratt, 1990, 1992; Samuelowicz & Bain, 1992).

**Thought Structures and Thought Processes**

Ernest (1989) has drawn a distinction between two aspects of the psychology of teaching: thought structures and thought processes. Thought structures are the dynamic, constantly changing and developing body of knowledge, beliefs, and attitudes permanently stored in the mind as schemas. They are differentiated from the fluid thought processes of planning, interactive decision-making, and reflection, although the two are integrally related in practice (Pintrich, 1990). Thought structures are the sources of and provide the basis for thought processes (Schon, 1983), which lead to actions, or occur in conjunction with or in response to actions. The development of thought structures, whether occurring as incremental fine-tuning or as more radical re-structuring, arises from the operation of thought processes. This distinction between thought processes and thought structures "parallels Schwab's (1961) division between the syntax and semantics of a discipline, and the traditional philosophical distinction between function and structure (Philp, 1973)" (Ernest, 1989, p. 13).

A synonym for thought structures is schemas. Rumelhart (1980) suggests that a useful way to think of a schema is as
a kind of informal, private, unarticulated theory about the nature of events, objects, or situations that we face. The total set of schema[s] we have available for interpreting our world in a sense constitutes our private theory of the nature of reality. (p. 37)

As thought structures, schemas do two things simultaneously (Nisbett & Ross, 1991; Sherman, Armistead, Fowler, Barksdale, & Reif, 1987; Yates & Chandler, 1991). They summarize our generic knowledge, beliefs, attitudes, and prior experience about a category of stimuli and events. At the same time, they grant meaning to and direct anticipation of future similar events and stimuli. Thus, they help people make sense of their experiences, and determine how they will respond to their environment. Frequently, however, we do not make sufficient allowance for the role played by thought structures in influencing action (Nisbett & Ross, 1991).

When we, thoughtfully and in specific situations, use generic schemas which fit those situations, the consequences of their use are good. But if we rely on thought structures which do not fit to help us interpret our worlds, or if we use thought structures which do fit inappropriately, the effects may be very different. Errors in judgement, and slowness both in recognizing and learning from the difficulties resulting from our inappropriate choice of schemas, are common (Nisbett & Ross, 1980, 1991). Schemas are carriers of both individual differences in interpretations of events and of instability of interpretation over time within the same individual. Just which knowledge structure is elicited, as well as the precise contents of knowledge structures representing particular aspects of the world, differ from person to person and from occasion to occasion. (Nisbett & Ross, 1991, p. 77)
Other types of thought (knowledge) structures considered to exist include diagnoses, routines or activity structures (Kagan, 1988); scripts (Nisbett & Ross, 1991); syllogisms (Argyris, 1985); intuitive screens (Goodman, 1988); images (Calderhead & Robson, 1991; Elbaz, 1981, 1983; Feiman-Nemser & Floden, 1986); and broad orientations to teaching (Rando & Menges, 1989). Regardless of the details of the specific structures, they all help us make meaning of the social situations in which we find ourselves, one of which is teaching.

The organization and content of schemas vary: generally, "the more complex and structured the schema[s], the more information and knowledge one has developed" (Sherman et al., 1987, p. 76). Individuals with sophisticated schemas are frequently recognized as experts whose problem-framing and solving abilities in their area of expertise are more advanced than those of the layperson or novice (Berliner, 1986; Kagan, 1988). Thus, the thought structures or schemas of teaching can be expected to vary widely, and to be open to change through thought and experience (Sherman et al., 1987). They continually evolve each time they are used: "New situations, negotiations and activities" (Brown, Collins & Duguid, 1989, p. 33) inevitably result in some change in thought structures, whether that change is simple fine-tuning or radical re-structuring.

Thus our thought structures, although permanent, are dynamic and constantly changing, always under construction and therefore never complete. Brown, Collins and Duguid (1989)
argue that knowledge (and by implication schemas) "is situated, being in part a product of the activity, context and culture in which it is developed and used" (p. 32). Such schemas cannot be separated from the contexts in which they are learned and used, because our interpretation of the world in which we use the schemas, and the thought structures themselves, continually change as a result of the interactions between them. However, different activities, contexts and cultures can have many areas of overlap. Thus, individuals beginning to teach, who have only partial schemas with which to interpret their teaching experiences and thoughts, draw meanings from other, more complete schemas that they have, for example those of being a student or a parent (Bullough & Knowles, 1991; McGill, Shaeffer & Menges, 1984). Yet, in the last analysis such meanings may or may not be fitting; the worth of a schema is finally proved by the "goodness of fit" of the meanings which it provides (Rumelhart, 1980, p. 39).

**Changes in Thought Structures:**

**Learning, Socialization and Development**

In considering how our understandings of teaching change, schema theory offers an explanation of the relationship between fit and schema change, using "assimilation" and "accommodation" (Bullough & Knowles, 1991). Assimilation occurs when a situation is interpreted and given meaning without the need for adjusting or fine-tuning the schema (Anderson, 1977). When a schema must change because of our inability to make a situation sufficiently and legitimately meaningful, necessitating a
"reorganization or reconstruction of meanings" (Bullough & Knowles, 1991, p. 123), accommodation occurs because the schema and the meanings derived from it do not fit the situation.

**Learning**

If we understand one aspect of learning to be conceptual change (Ramsden, 1988b), "a qualitative change in a person's way of seeing, experiencing, understanding, conceptualizing something in the real world" (Marton & Ramsden, 1988, p. 269), then accommodation, or changes in the knowledge, beliefs and/or attitudes comprising the thought structures on which thought processes and actions are based, is learning (Hewson & Hewson, 1989). In the context of beliefs about teaching, when we change our beliefs and understandings about teaching, we are learning about teaching; we may or may not be becoming better teachers. In considering how teachers acquire and change their beliefs about teaching, we can ask "whether individual teachers learn these views (intentionally or unintentionally) from other educators, or whether they come up with such views on their own" (Feiman-Nemser & Floden, 1986, p. 520), or whether some combination of both exists.

Possible answers to such questions examine the effects of socialization and the processes of individual development on the acquisition and modification of beliefs about teaching.

**Socialization**

Research on teacher socialization examines how teacher knowledge, beliefs, values, and attitudes are transmitted.
Most such studies have focused on student teaching and the first year of teaching for elementary and secondary school teachers, "periods that are probably central to any process for passing on a teaching culture" (Feiman-Nemser & Floden, 1986, p. 520). Research in this area examines the influence on new teachers of experienced teachers, principals, the university, fellow beginning teachers, students (Feiman-Nemser & Floden, 1986; Zeichner & Tabachnick, 1985), and the teachers who have taught them over the years (Lortie, 1975).

While it appears that experienced teachers may have the most influence, it is questionable whether all experienced teachers have similar beliefs and values (Fox, 1983; Pratt, 1992; Richardson, Anders, Tidwell & Lloyd, 1991; Samuelowicz & Bain, 1992), and whether new teachers are passive recipients of a teaching culture (Feiman-Nemser & Floden, 1986; Zeichner & Tabachnick, 1985). Questions also exist about whether new teachers change their beliefs and values significantly (Lacey, 1977; Zeichner & Tabachnick, 1985). Thus while socialization pressures appear to influence teachers' beliefs, other processes may also be influencing teachers as they acquire and change their beliefs.

Development

Researchers interested in teacher development are also concerned with describing and explaining how teachers' knowledge, beliefs, values, and attitudes change. However, they see the process as being internally guided rather than occurring in response to the externally imposed values and
practices of a socializing group (Feiman-Nemser & Floden, 1986).

Feiman-Nemser & Floden (1986) identify three distinct approaches to teacher development in the literature: "a model of changes in teacher concerns, a model based on cognitive-developmental theories, and a style of inservice education emphasizing teachers' own definitions of their needs" (p. 522). The first model is concerned with stages through which teachers pass as they gain experience: from being concerned with their own adequacy and survival, through focusing on performance, to being concerned with students' learning and their contributions to it (Fuller, 1969, cited in Feiman-Nemser, 1986; Harrington & Sacks, 1984).

The second approach is based on theories of cognitive development and general changes in cognitive processes. Several researchers on teaching have proposed that differences in understandings about teaching and various aspects of teaching are related to different levels of cognitive (Piaget, 1972), conceptual (Hunt, 1974), moral (Kohlberg, 1976), ego (Loevinger, 1976) or interpersonal (Selman, 1980) development (Bussis, Chittenden & Amarel, 1976; Oja & Ham, 1984; O'Keefe & Johnston, 1989; Pratt, 1989; Sprinthall & Thies-Sprinthall, 1983).

The third approach is more of an educational intervention than a model of teachers' development. It emphasizes responding to teachers' definitions of their learning needs, directions for growth, and motivation for taking on curricular
responsibility (Feiman-Nemser & Floden, 1986), as a way of helping teachers grow professionally.

Pintrich (1990) also looks at teacher development. In an extensive review of the literature related to student learning and development and college teaching, he proposes four answers to the question 'what develops?' in teacher development. They include: (1) teachers' knowledge about their content area, pedagogical practices, issues in learner development, learning and motivation, epistemological and metaphysical beliefs, and beliefs about themselves; (2) teachers' reasoning, problem-solving and thinking skills, in various domains; (3) teachers' metacognitive control, self-regulation of and self-reflection on cognition and actions; and (4) teachers' motivational goals, values, and beliefs.

Regardless of what is developing, development is seen as a progression from basic or elementary to increasingly complex and distinct ways of interpreting the world and functioning within it (Oja & Ham, 1984).

Summary and Definitions

Initial research into the psychological foundations of teaching focused on thought processes, the fluid processes of planning (intentions), interactive decision-making, and reflection which occur before, during, and after teaching, and from which arise changes in permanent thought structures. However, research on and interest in teachers' permanent thought structures or schemas is growing.
Thought structures or schemas are our private, informal and often unarticulated theories about phenomena that we experience. Summarizing our previous knowledge, beliefs and attitudes, they provide meaning for and guide anticipation of future similar phenomena. They are differentiated from thought processes, although the two are integrally related in practice. Thought structures are the sources of and provide the basis for thought processes, which lead to actions. They are continually evolving, vary widely, and are open to change through thought and experience. The development of thought structures, whether occurring through incremental fine-tuning, or through more radical re-structuring, originates from the operation of thought processes. Although thought structures can not be separated from the contexts in which they are learned and used, because of areas of overlap between contexts meanings from one context can be used in another, whether or not the meanings thus created are appropriate. The worth of a schema is proved by the fit of the meanings which it creates.

Some theorists and researchers suggest that the context in which thought structures are used, and socialization pressures from individuals and groups within that context, influence changes in thought structures. Others suggest that changes in schemas may be related to levels of human development. Whether the important influences are related to socialization, levels of human development, other factors, or some combination thereof, thought processes and actions are affected when thought structures change. Thus, a first step in furthering our understandings of these relationships, and
eventually helping teachers to better understand their own thinking and actions, is to obtain more knowledge about the different thought structures of teachers. The following section reviews relevant current research concerning the belief aspects of teachers' thought structures, and the changes which occur in such beliefs.

Recent Research on Beliefs about Teaching

Much of the initial work on teachers' thinking focused on thought processes and actions, rather than thought structures. While this area is now receiving more interest, the current focus is primarily on the knowledge aspects of teachers' thought structures. Less work has been done on the affective components of beliefs and attitudes.

(Kloss, 1987; Munby, 1982, 1986), perspectives (Goodman, 1988; Tabachnick & Zeichner, 1984; Zeichner & Tabachnick, 1985), philosophies (Holt & Johnston, 1989), and values (Zahorik, 1977). While in some cases the terms vary in meaning, in others they are treated as completely interchangeable: for example, Samuelowicz and Bain (1992) interchange conceptions and theories; Richardson, Anders, Tidwell and Lloyd (1991) do the same with beliefs and theories; Borko, Lalik and Tomchin (1987) use conceptions and perspectives interchangeably; etc. Regardless of whether these concepts are thought to be synonymous or to differ somewhat in meaning, they hold in common the idea that teachers' behaviour and intentions (actions and thought processes) are guided by and make sense in relation to personally held systems of beliefs, principles, and values (the belief aspects of thought structures). These belief systems are frequently "expressed as either normative or causal propositions held with varying degrees of clarity, confidence and centrality" (Pratt, 1992, p. 208). They may vary from "a relatively amorphous collection of ideas with no strong connections to one which is interrelated and possesses a large measure of internal consistency" (Hewson & Hewson, 1989, p. 194). Some are the result of explicit and critical reflection; others are implicitly taken-for-granted, neither well defined nor well articulated.

Despite definitional inconsistencies and the focus by different researchers on diverse components of thought structures which often overlap but are seldom identical, valuable information concerning teachers' beliefs about
teaching has been brought to light. Somewhat less information is available about the changes which occur in such beliefs. This section presents the significant and overlapping data from research on beliefs about teaching, synthesizing relevant findings from teacher education, adult education and post-secondary education.

My Beliefs, Your Conceptions, Her Metaphors, His Theories

Research examining each of the nine concepts identified above—beliefs, conceptions, ideology, images, implicit, personal or tacit theories, metaphors, perspectives, philosophies and values—is briefly discussed. The relevant findings from this literature, common, unique, and/or contradictory, are identified for each concept. The section concludes with an overall summary.

Beliefs

While not all researchers who examine beliefs define the term, a definition from Harvey (1986) provides some insight for this review. The research reviewed here looks at belief systems as "set[s] of conceptual representations which signify to [their] holder[s] a reality or given state of affairs of sufficient validity, truth and/or trustworthiness to warrant reliance upon [them] as . . . guide[s] to personal thought and action" (Harvey, 1986, p. 660).
TABLE 1

Beliefs about Teaching

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<td>Richardson, Anders Tidwell &amp; Lloyd 1991</td>
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Apps (1982, 1989) focuses on the need for adult educators to identify and examine their personal beliefs and values, proposing an analysis process and a framework which may be used to do this, and which he has used for several years. Particularly relevant to this research are the four groupings of beliefs which make up his framework: (1) beliefs about learners; (2) our aims for our teaching; (3) beliefs about the
subject matter content of our teaching; and (4) beliefs about
teachers and the teaching-learning transaction.

Ernest (1989) proposes an analytic model of the thought
structures—knowledge, beliefs and attitudes—of mathematics
teachers, and their relationship to the practice of teaching
mathematics. In relation to the belief aspects of thought
structures, he identifies three groups of beliefs, each of
which he then further sub-divides. The first consists of
conceptions about the subject matter—mathematics—as a whole.
These conceptions form the basis for teachers’ philosophies of
mathematics which, in practice, may combine elements from
different conceptions. The second is beliefs or mental models
of the teaching and learning of the subject (mathematics). He
sees a mental model of teaching as the primary determinant of
how the subject is taught, within the bounds of contextual
constraints. The mental model of learning the subject relates
to the activities of the learners, and the amount of choice and
volition assigned to them. The third area of beliefs is that
of principles of education—"the very general values, beliefs
and principles that underpin a teacher’s view of the aims and
purposes and nature of education" (p. 24). The more teachers’
beliefs and actions form integrated wholes, the more effective
are teachers’ principles. Ernest is currently testing the
model empirically.

Hollingsworth (1989) looks at changes in student
teachers’ knowledge and beliefs about teaching reading, before,
during, and after a one year teacher education program with a
practicum. Through interviews and observations of fourteen
elementary and secondary student teachers, she traces changes in "global preprogram beliefs about education, teaching, and learning" (p. 160), and the influences or constraints on those changes. Prior beliefs are found to be important in understanding student teachers' learning. Changes in beliefs (growth in thought structures) occur when student teachers are placed with cooperating teachers holding different beliefs, who encourage discussion of contrasting viewpoints and support the student teachers in exploring and trying their own ideas.

Munby (1982) examines teachers' beliefs, principles and "repertories of understanding" (p. 201) in a brief case study of one teacher. He uses Kelly's Repertory Grid Technique, identifying five beliefs: (1) caring for the students is as important as the curriculum, if not more so; (2) teaching and learning is carried out purposefully and in a well-behaved manner; (3) learning needs considerable activity; (4) "open and candid relationships" (p. 223) are needed for teaching and learning; and (5) her learners (seventh graders) are not mature enough to make "fully valid judgements" (p. 223). Thus he identifies beliefs about: (1) learners; (2) content; (3) the teaching-learning transaction; and (4) the teacher-learner relationship.

Richardson, Anders, Tidwell and Lloyd (1991) investigate the relationship between teachers' classroom practices and their beliefs about the teaching of reading comprehension, using a beliefs interview technique from anthropology. The beliefs identified are located along two continuums forming a quadrant. The vertical continuum is concerned with reading and
the purpose of reading, ranging from 'meaning is constructed by
the student from an interaction with the text,' to 'meaning is
in the text.' The horizontal continuum is concerned with
approaches to reading, and ranges from a 'word and skills
approach' to a 'literature approach.' Findings indicate that
teachers' beliefs relate to their classroom practices. In one
case where a teacher's beliefs and practices do not relate,
Richardson et al. suggest that the teacher is involved in
changing her beliefs and practices, with changes in beliefs
occurring first. They postulate that changes must occur in
both beliefs and in practices that embody those beliefs to
ensure effective implementation and avoid teacher frustration.
"Genuine changes will come about when teachers think
differently about what is going on in their classrooms, and are
provided with the practices to match the different ways of
thinking" (p. 579).

In summary, researchers looking at "beliefs" have
identified several groupings of beliefs: (1) beliefs about
learners; (2) beliefs about the aims of teaching, learning and
education; (3) beliefs about subject matter content
(knowledge); (4) beliefs about teachers; and (5) beliefs about
the teaching-learning transaction.

Several other findings relevant to this research are also
identified. Contextual constraints and supports are identified
as influencing the belief aspects of thought structures about
teaching in a variety of ways. Teaching is a complex, dynamic
activity, and many factors must be considered when we think about or practise it.

Various studies establish that beliefs and actions are integrally related in teaching practice.

Finally, one study (Richardson et al., 1991), notes the possibility that incongruency between beliefs and actions may be an indication that teachers are involved in the process of changing their beliefs, and that beliefs may change before actions. This possibility conflicts with an existing model of staff development, which is based on the notion that changes in the beliefs of teachers take place once positive results are achieved from changes in teaching behaviour (Guskey, 1986). Further research is needed to clarify the relationship between changes in beliefs and actions.

Conceptions

Definitional inconsistencies also exist among the work on conceptions, since some researchers do not explicitly state their definitions. However, for those using a phenomenographical approach (Dall’Alba, 1991; Larsson, 1983, 1984; Martin & Balla, 1991; Pratt, 1990, 1992; Samuelowicz & Bain, 1992), conceptions are defined as "abstract, cognitive representation[s] of some phenomenon" (Pratt, 1992, p. 220). This definition also appears to be applicable to the research reviewed here.
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<tr>
<th>Research</th>
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<td>Bullough &amp; Knowles 1991</td>
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| Martin & Balla 1991   | Beliefs about:  
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|                       | Learners  
|                       | Teaching-learning relationship  
|                       | Changes in beliefs  |
| Pratt 1990            | Beliefs about:  
|                       | Content  
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|                       | Learning  
|                       | Teachers  
|                       | Learners  
|                       | Aims of teaching  
|                       | Teaching-learning relationship  
|                       | Context  |
| Pratt 1992            | Beliefs about:  
|                       | Content  
|                       | Teaching  
|                       | Learning  
|                       | Teachers  
|                       | Learners  
|                       | Aims of teaching  
|                       | Teaching-learning relationship  
|                       | Context  |
| Samuelowicz & Bain    | Beliefs about:  
| 1992                  | Content  
|                       | Teaching  
|                       | Learning  
|                       | Teachers  
|                       | Learners  
|                       | Aims of teaching  
|                       | Teaching-learning relationship  
|                       | Context  |
| Zahorik 1985          | Beliefs about:  
|                       | Teaching  
|                       | Aims of teaching  
|                       | Changes in beliefs  |
Borko, Lalik & Tomchin (1987) examine 14 student teachers' stated conceptions of successful teaching, through analysis of successful and unsuccessful lessons, and through examination of written self-assessments of their development as teachers over the course of a year, kept in the form of journals. All of the students hold similar conceptions of successful teaching, which are multi-dimensional, utilizing unique, creative ideas to present the curriculum in a way that fosters students' active participation, learning, and positive affect. [They are] further characterized by efficient use of time, pacing appropriate to the learners, suitable (often innovative) organization of learners, and a positive approach to classroom management and discipline. (p. 87)

These conceptions are based on beliefs about: (1) content, (2) learners, (3) learning, (4) teaching, (5) teachers, and (6) the teaching-learning transaction. Weaker students' conceptions of unsuccessful lessons vary more from the conceptions of successful teaching than do those of the stronger students. Conceptions of successful teaching held by all of the students remain stable throughout the year.

Bullough & Knowles (1991) follow changes in a first year teacher's strong conception of herself as teacher through a year long case study. The teacher saw teaching as parenting, and to parent was to nurture; thus she overlaid her parent schema onto her teacher role. Her teaching metaphor thus became 'teacher as nurturer.' She maintained her personal teaching metaphor throughout the year, while partially reconstructing it to better fit her experience of her teaching situation. The reasons for the changes in her metaphor, primarily contextual, are explored.
Dall'Alba (1991) examines conceptions of teaching held by 20 teachers in post-secondary education, who taught in four different subject areas. Her preliminary data analysis yields seven conceptions of teaching: (1) teaching as presenting information, (2) teaching as transmitting information (from teacher to student), (3) teaching as illustrating the application of theory to practice, (4) teaching as developing concepts/principles and their interrelations, (5) teaching as developing the capacity to be expert, (6) teaching as exploring ways of understanding from particular perspectives, and (7) teaching as bringing about conceptual change. The conceptions are considered to be ordered from less to more complete understandings of teaching, with the relationship

"between teaching and student learning ... the key feature on which the ordering of the conceptions is based. ... Progressing from lower to higher level conceptions of teaching, there is increasing responsibility for learning on the part of both the student and the teacher." (p. 296)

The implication is that the different conceptions are related to levels of development as a teacher, although she states that further analysis of the data is required. Dall'Alba (1991) also finds that "conceptions of teaching are not entirely subject-related in the sense that some teachers have conceptions of teaching which are shared by teachers in other subject areas" (p. 293).

Hewson and Hewson (1989) develop an "interview task to identify teachers' conceptions of teaching science" (p. 191). Different components of the conceptions are identified as: (1) the nature of the subject (science), (2) learning, (3) learner
characteristics, (4) rationale for instruction, (5) preferred teaching techniques, and (6) their interrelationships. They demonstrate that use of the task permits analysis of the conceptions of student science teachers for internal consistency, stability over time, and differences within components of their conceptions.

Larsson (1983, 1984), in interviews with 29 Swedish adult educators, examines their conceptions of teaching—what they consider the essence of teaching to be, how they teach, and their conceptions of the "restrictions on their freedom to act as teachers" (1983, p. 357). Of relevance to this research are the two conceptions of teaching that Larsson identifies: (1) teaching is presenting and structuring content for the learners; and (2) teaching is involving the learners in interpreting and structuring their work with the content.

Martin & Balla (1991) interview thirteen post-secondary teachers enrolled in a course designed to help them improve their understandings of teaching. The interviews take place at the beginning and the end of the first semester. They find three levels of conceptions, with a number of sub-conceptions or perceptions clustered around two of the levels. The levels of conceptions include: (1) teaching as presenting information, with two sub-categories—a delivery focus and a content organization focus; (2) teaching as encouraging active learning, with four sub-categories—a motivation focus, a discussion focus, an experiential focus and a vocational variation; and (3) relating teaching to learning. They present the conceptions as a hierarchy, beginning with ‘teaching as
presenting information with a delivery focus,' developing to the third conception, 'relating teaching to learning,' which they see as integrative, "incorporating and building on all the other conceptions" (p. 302). Moving up the hierarchy, each conception and sub-conception is encompassed by the one above it. Again, the implication is that conceptions are related to levels of development as a teacher, and that better teachers hold higher level conceptions of teaching. Martin and Balla (1991) conclude by discussing some implications of the various conceptions for the teaching and learning transaction.

Pratt (1990) interviews 57 Chinese adult educators about their conceptions of teaching and learning. He identifies three conceptions of teaching: (1) the delivery of content--teacher as transmitter of knowledge, (2) the development of character--teacher as role model, and (3) a type of relationship--teacher as helper or guide for the learner. He then relates these conceptions of teaching to the conceptions of learning identified, discussing their similarities and differences. He does not look at how the conceptions change.

In a study which incorporates the 1990 data, Pratt (1992) interviews over 250 teachers over five years in an attempt to articulate how teaching is understood within several societies. Five qualitatively different conceptions of teaching, varying in terms of three interdependent aspects--beliefs, intentions, and actions--are identified. Each conception is also expressed in terms of at least one of five elements, content, learners, teachers, ideals, and context, and the interrelationships between these elements. The conceptions include: (1)
engineering--delivering content, (2) apprenticeship--modelling ways of being, (3) developmental--cultivating the intellect, (4) nurturing--facilitating personal agency, and (5) social reform--seeking a better society. He concludes that conceptions of teaching are contingent on prior understandings and beliefs about learning, knowledge, and self as learner and teacher, derived from one’s cultural context. While the conceptions are different, each has its own philosophical and epistemological grounding consonant with particular purposes and contexts, and exemplary teachers may be found who hold each conception. The challenge is to understand conceptions other than our own and the ways in which they make sense and work for others.

Samuelowicz and Bain (1992) examine conceptions of teaching held by 13 post-secondary teachers at two universities. They propose a five level classification of conceptions of teaching: (1) teaching as supporting student learning, (2) teaching as an activity aimed at changing students’ conceptions or understanding of the world, (3) teaching as facilitating understanding, (4) teaching as transmission of knowledge and attitudes to knowledge within the framework of an academic discipline, and (5) teaching as imparting information. They also propose a formal coding system "which helps to delimit, with greater confidence, the boundaries of each conception, and helps to order conceptions, to compare conceptions proposed by other researchers, and to place individuals within conceptions" (p. 2). They find that, for some teachers, conceptions may be context-dependent.
Additionally, preliminary observations indicate that teachers may have both 'ideal' and 'working' conceptions of teaching. 

Zahorik (1986) identifies three broad conceptual categories of good teaching, defining and discussing several conceptions within each category. The categories include: (1) science-research, (2) theory-philosophy, and (3) art-craft. Science-research conceptions have been derived through research and include: "doing what effective teachers do; following a tested model; [and] operationalizing learning principles" (p. 21). Theory-philosophy conceptions are based on what should work or what is morally right, rather than on inductively derived conditions or on what works, and include "implementing a theoretical model, [and] implementing a philosophical model" (p. 21). The art-craft conception considers teaching to be a reflective, individualistic activity, performed "in resourceful, creative ways" (p. 21). He sees these three conceptual categories and their related teaching skills as hierarchical in the sense of developmental stages, such as Fuller's (1969) stages of teachers' concerns. The hierarchy of categories moves from the science-research conception through theory-philosophy to art-craft as the highest level. He sees teachers moving through these levels as they gain experience.

In summary, the beliefs about teaching identified by researchers interested in conceptions of teaching include beliefs about: (1) learners; (2) the aims of teaching; (3) content or knowledge; (4) teachers; (5) learning; (6) teaching; (7) the interrelationships between one or more of teacher,
learners, content, context and ideals; and (8) the teaching-learning transaction.

Other relevant findings are somewhat contradictory. Dall'Alba (1991) finds that conceptions may not be totally context or subject related: some teachers hold conceptions of teaching shared by those who teach in other subject areas, for example, physics and economics. Samuelowicz and Bain (1992), however, state that for some post-secondary teachers, conceptions of teaching may be context-dependent. They find that influences such as the level of a course—undergraduate or post-graduate, and the type of students in the course—general studies versus majors students, heavily influence how some teachers think about teaching. For two teachers in particular, they are able to identify distinctly different "conceptions of teaching that varied according to the level of teaching" (p. 19).

Samuelowicz and Bain (1992) also postulate that teachers may hold both ideal and working conceptions of teaching. They suggest, from limited data, that teachers' expressed aims of teaching may coincide with their ideal conceptions, while their teaching practices exemplify their working conceptions of teaching, applicable within a particular context. Menges and Rando (1989) discuss a similar concept when they differentiate between espoused theories of teaching, and teaching theories-in-use. Richardson, Anders, Tidwell and Lloyd (1991) also identify a similar dichotomy between teachers' declared or public beliefs and their more private beliefs or beliefs-in-action, both of which they investigated in their research.
Zeichner and Tabachnick (1985), in elaborating on Lacey's (1977) social strategies used by student teachers, identify a similar possibility. These social strategies are types of responses made by prospective teachers in the face of institutionalized constraints which conflict with their beliefs about teaching. Responses may include: (1) 'internalized adjustment' where the student teacher accepts the constraints, conforming both in actions and in value commitment; (2) 'strategic compliance,' where individuals conform in their actions, while retaining personal reservations about so doing, thus not making a value commitment to those actions; and (3) successful or unsuccessful 'strategic redefinition,' where attempts are made by individuals to widen the range of acceptable actions in a situation to include those to which their values commit them. Thus situations exist where certain teaching actions, inconsistent with student teachers' beliefs about teaching, are supported. In these contexts, the student teachers may retain an ideal conception, while either strategically complying with the situation, or attempting to enact some strategic redefinition to resolve the incongruency.

**Ideology**

A 'teaching ideology' can be defined as a connected set of systematically related beliefs and ideas about what are felt to be the essential features of teaching . . . a broad definition of the task and a set of prescriptions for performing it, all held at a relatively high level of abstraction." (Sharp & Green, 1975, pp. 68-69, cited in Tabachnick & Zeichner, 1984, p.29)
This definition is similar to that used by Zahorik (1990, 1991), and is similar to the definitions of some of the concepts previously discussed.

TABLE 3
Ideologies of Teaching

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<th>Research</th>
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<tr>
<td>Zahorik 1990, 1991</td>
<td>Beliefs about: Learners, Content, Teaching, Teaching-learning transaction</td>
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</table>

Zahorik (1990) looks at styles of teaching and textbook use among four elementary school teachers. He finds three styles of teaching: (1) text-coverage, stressing acquisition of content; (2) text-extension, again stressing acquisition of content, but also using activities that require application; and (3) text-thinking, where the teacher engages the learners in activities which need creative and critical thinking. He also looks at the relationship of teachers' ideologies to these teaching styles, and finds "that the text-thinking teacher had different beliefs about students, knowledge, and teaching than the other types of teachers" (p. 186).

In an extension of that study, Zahorik (1991) looks at the relationships between textbook use, teaching style and teaching ideologies among 103 experienced school teachers.
Findings indicate that teaching style is related to teacher ideology. The three styles found in the original study (coverage, extension, and thinking) were again identified, this time with four sub-types—coverage-information, coverage-mastery, thinking-ending and thinking-integral. The three styles are related to teacher ideology, where ideology is defined as beliefs about "central aspects of the teaching act" (p. 186): students, knowledge and teaching.

Thinking-style teachers have stronger beliefs that students are active, knowledge ought to be functional, and teachers should use indirect methods than do extension-style teachers, and extension-style teachers have stronger beliefs in active students, functional knowledge, and indirect teaching than do coverage-style teachers. (p. 194)

Zahorik sees teacher ideology as "a powerful factor in determining how a teacher will teach" (p. 195), and believes that more investigation of "teachers' fundamental beliefs about students, knowledge, and teaching" (p. 195) is needed to facilitate further understanding of teacher ideology.

To sum up, the beliefs about teaching identified by Zahorik (1990, 1991) in his work on teacher ideologies include beliefs about: (1) learners, (2) knowledge or content, (3) teaching, and (4) the teaching-learning transaction.

Images

The researchers looking at images see them as mental models of how teaching should be (Calderhead & Robson, 1991; Elbaz, 1981, 1983). Ernest (1989), in his research on beliefs,
also identifies mental models of teaching as an important component of beliefs about teaching.

**TABLE 4**

**Images of Teaching**

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<td>Elbaz 1981, 1983</td>
<td>Beliefs about:</td>
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Calderhead & Robson (1991) look at understandings of learning, teaching and the curriculum as images or mental models of teaching held by 12 student teachers participating in a first year B. Ed. course. The images are considered to be "ways of representing knowledge that could readily be translated into action, sometimes synthesizing quite large amounts of knowledge about teachers, children, teaching methods, and so on" (p. 7). Students hold specific images, which are "sometimes highly influential in their interpretation of the course and of classroom practice" (p. 1).
Elbaz (1981, 1983) looks at one teacher's practical knowledge. In describing the organization of this teacher's knowledge, she distinguishes three levels of generality: rules of practice, practical principles and images. The level relevant to this research is that of images, which orient a teacher's overall practice, as opposed to guiding specific actions. "The teacher's feelings, values, needs and beliefs combine as she forms images of how teaching should be, and marshals experience, theoretical knowledge, [and] school folklore to give substance to these images" (p. 134). Images are seen to "guide teachers intuitively, inspiring rather than determining their actions . . . [while] generating new rules and principles and . . . helping to choose among [the new rules and principles] when they conflict" (Feiman-Nemser & Floden, 1986, p. 514).

In summary, the beliefs about teaching identified by those who research images of teaching are beliefs about: (1) learning, (2) teaching, (3) content, and (4) the teaching-learning transaction.

**Implicit, Personal or Tacit Theories**

Rando and Menges (1991) define implicit personal theories as "our individual submerged rationales about events in the world and about our own behaviour in the world" (p. 7). Such theories guide our practice whether productively and accurately, or inaccurately and counter-productively. They are
For several years, Fox (1983) interviewed newly appointed polytechnic teachers about what they meant by "teaching." Some teachers hold what he classifies as simple theories, for example, the "shaping" theory where the student is regarded as material to be shaped or moulded, and the "transfer" theory where the learner is perceived as a vessel or container to be filled with knowledge. Other teachers, often those with more experience, hold what he calls developed theories, such as the
"growing" theory where the teacher is seen as a gardener, encouraging the intellectual and emotional growth of the student, or the "travelling" theory, where the teacher serves as an expert guide over the terrain of the subject matter. In developed theories, learners are more commonly seen as active participants or contributing partners, whereas in simple theories they are viewed as passive recipients of knowledge or training. These theories are ordered theories, based on dichotomous views of learners.

Menges & Rando (1989) use interviews to investigate the implicit theories held by twenty graduate teaching assistants, asking questions about: (1) what they mean by teaching, (2) how they respond to everyday classroom events, and (3) what assumptions they make regarding those events. They identify three different orientations to teaching: (1) teaching as content, (2) teaching as process, and (3) teaching as motivation. In diagnosing teaching problems, more than two thirds of the teaching assistants rely on generalized past experience; far fewer seek new, situationally specific information. In taking actions to deal with problems TAs make one of two choices: they either persist in the activity or they chose a different activity, i.e. they default. Menges and Rando suggest that implicit theories held by TAs partially explain why they respond to difficulties in different ways. For example, TAs for whom content is central emphasize transmission of content in their actions, and often default to a different technique. Those who are process oriented persist, trying to get a discussion going, since the process is an end
in itself. Motivation oriented teachers, who are primarily interested in students' affect and interest levels, plan discussions to make the content interesting and exciting. If the plan does not succeed, they default to avoid making matters worse.

Pinnegar and Carter (1990) compare theories of student learning from textbooks with teachers' tacit learning theories. They find that the theories presented in the texts differ from those of the teachers in goals, in words used, and in major concepts. Teachers' tacit theories of classroom learning focus on the relationship between teachers and students, the establishment of respect and trust, and the importance of confidence, personal interest, and enthusiasm. These theories suggest that many teachers believe that classroom learning is based on student-teacher relationships that develop as they engage in learning together. (p. 26)

In summary, the beliefs about teaching identified by these researchers include beliefs about: (1) learners, (2) content, (3) teachers, (4) teaching, (5) learning, (6) the teaching-learning transaction, and (7) the teacher-learner relationship.

Also relevant is the reliance by many teaching assistants on generalized prior experience to identify teaching problems, rather than seeking new and situationally specific information (Menges & Rando, 1989). The relationship of beliefs to actions is again made manifest.
Metaphors

Munby (1986) defines metaphor as "a process by which we encounter the world . . . [which] offer[s] a different way of perceiving reality" (p. 199). Lakoff and Johnson (1980) argue that thought processes are primarily metaphorical, and that we structure and define concepts metaphorically, thus allowing ourselves to use metaphors as linguistic expressions. These linguistic expressions can then be analyzed for the meaning they hold for those who use them.

TABLE 6

Metaphors for Teaching

<table>
<thead>
<tr>
<th>Research</th>
<th>Findings Include:</th>
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<tbody>
<tr>
<td>Kloss 1987</td>
<td>Beliefs about:</td>
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<td>Content</td>
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<td>Learners</td>
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<td>Context</td>
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<tr>
<td>Munby 1986</td>
<td>Beliefs about:</td>
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Kloss (1987) examines his own and others' use of metaphors for teaching, which incorporate assumptions about content, learners, teacher, and context, and relates the metaphors to the actions of the teacher while teaching. He concludes that the metaphors or beliefs which teachers hold
about teaching strongly influence their actions, and that some metaphors are more damaging to effective teaching than others.

Munby (1986) considers metaphor as imagery which, if we can decode the images, helps us to understand how teachers view their worlds. Metaphorical language is used "to give tacit knowledge voice" (p. 198), and thus analysis of it is one fruitful way of beginning to understand how teachers construct their educational reality. He examines interview transcripts from 17 interviews with one teacher, identifying a major metaphorical figure of 'lesson as moving object,' which "represent[s] a significant feature of how [she] constructs her world of teaching" (p. 206), and which influences how she functions within that world.

In summary, beliefs about teaching identified by those who examine metaphors for teaching include beliefs about: (1) content, (2) learners, (3) teachers, and (4) context. Also relevant is the relationship between beliefs and actions.

**Perspectives**

"Unlike more abstract constructs such as attitudes or values, perspectives have reference to particular phenomena and include an individual's actions rather than just his/her disposition to act" (Becker, Geer, Hughes & Strauss, 1961, cited in Goodman, 1988, p. 121). Perspectives take into account how situations are experienced, how they are interpreted "given the teacher's previous experiences, beliefs,
and assumptions" (p. 121), and how the teacher's behaviour exhibits these interpretations.

TABLE 7
Perspectives on Teaching

<table>
<thead>
<tr>
<th>Research</th>
<th>Findings Include:</th>
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<tbody>
<tr>
<td>Goodman 1988</td>
<td>Beliefs about:</td>
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<td>Teachers</td>
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<td>Learners</td>
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<td></td>
<td>Aims of teaching</td>
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<tr>
<td>Tabachnick &amp; Zeichner 1984</td>
<td>Beliefs about:</td>
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<td></td>
<td>Aims of teaching</td>
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<td>Context</td>
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<td>Changes in beliefs</td>
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<tr>
<td>Zeichner &amp; Tabachnick 1985</td>
<td>Beliefs about:</td>
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<td>Aims of teaching</td>
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<td>Changes in beliefs</td>
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Goodman (1988) looks at student teachers' professional perspectives and how they use them to construct practical philosophies of teaching. He identifies two broad perspectives: (1) teaching as a problem of control, and (2) teaching as facilitation of children's growth. Students interpret these two perspectives differently, depending on the 'guiding images' on which the perspectives are based. The
guiding images around which the first perspective is organized are different understandings of cooperation, authority and autonomy. For the second perspective, the guiding images are alternative understandings of individualization and self-concept. These guiding images are based on the intuitive screens or schemas which each student holds, and which they use to interpret their teaching worlds. The beliefs identified in these perspectives are primarily beliefs about learners and the aims of teaching.

Tabachnick and Zeichner (1984) examine how student teaching influences the development of teaching perspectives, looking particularly at its socializing role. Their definition of perspectives is based on that of Becker et al. (1961). However, they more clearly relate it to teaching, considering teacher perspectives to be "the ways in which teachers [think] about their work (e.g. purposes, goals, conceptions of [learners], curriculum) and the ways in which they [give] meaning to these beliefs by their behaviour in classrooms" (p. 28). The research examines the perspectives of 13 student teachers through multiple interviews and observations over a semester. Perspectives are defined in relation to students' resolutions of eighteen dilemmas of teaching. The dilemmas are related to knowledge and curriculum, teacher-student relationships, the role of the teacher, and learner diversity. For most student teachers, "perspectives solidified but did not change fundamentally over the course of the . . . semester" (p. 33). Most student teachers "became more articulate in expressing and more skilful in implementing the perspectives
that they possessed in less developed forms at the beginning of the experience" (p. 33). However, three student teachers did not develop their perspectives. Rather, they conformed in behaviour to contextual constraints at odds with their perspectives, and to which they had no underlying value commitment. Findings suggest that "what student teachers bring to their teaching experience gives direction to socialization but does not totally determine the outcome of the socialization process" (p. 28).

A follow-up study (Zeichner & Tabachnick, 1985; Zeichner, Tabachnick & Densmore, 1987) found that "beginning teachers under some conditions at least were able to maintain a perspective which was in conflict with the dominant institutional cultures in their schools" (Zeichner & Tabachnick, 1985, p. 14).

In summary, the beliefs about teaching identified by researchers examining teaching perspectives include beliefs about: (1) learners, (2) teachers, (3) content, (4) the teaching-learning transaction, and (5) the teacher-learner relationship.

Other relevant findings include the range and importance of the influence of context, in several ways, on beliefs about teaching. Contextual constraints influence the extent to which individuals can maintain congruency between their beliefs and their actions, and are one of the factors affecting changes in thought structures. Conversely, positive contextual influences, particularly those which allow for trying out new
ideas and subsequent discussion and reflection, may provide opportunities for clarification and solidification of prior beliefs.

Philosophies

Holt and Johnston (1989) do not specifically define educational philosophy. However, Goodman (1988) considers that a practical philosophy of teaching "emerges from an individual's personal experience and is used as a guide for one's actions" (p. 121).

TABLE 8
Philosophies of Teaching

<table>
<thead>
<tr>
<th>Research</th>
<th>Findings Include:</th>
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<tbody>
<tr>
<td>Holt &amp; Johnston 1989</td>
<td>Beliefs about:</td>
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<td>Content</td>
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<td>Learners</td>
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<td>Teachers</td>
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<td>Changes in beliefs</td>
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Holt and Johnston (1989) look at changes in the educational philosophies and practices of two teachers, resulting from participation in a graduate program in education. One teacher examined her practice and changed her philosophy significantly after identifying incongruencies between the two; the other questioned her philosophy extensively but made few changes in her practice. Both
teachers changed "in the direction of the guiding philosophy of the Masters program" (p. 81), which attempts to have teachers review their own practice, examining how it relates to and can be informed by the views and research of others.

In summary, Holt and Johnston (1989) found beliefs about: (1) content, (2) learners, and (3) teachers.

Also relevant is the evidence of the specific influence on thought structures, processes, and actions of a program designed to help teachers examine and clarify their beliefs.

Values

TABLE 9

Values for Teaching

<table>
<thead>
<tr>
<th>Research</th>
<th>Findings Include:</th>
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<tbody>
<tr>
<td>Zahorik 1977</td>
<td>Beliefs about:</td>
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<td>Learners</td>
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<td>Content</td>
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<td>Teaching-learning transaction</td>
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<tr>
<td></td>
<td>Aims of teaching</td>
</tr>
</tbody>
</table>

Zahorik (1977) examines five bases on which to make decisions about teaching behaviour: (1) empirical process-product research, (2) prescriptions by experts, (3) modelling of effective teachers, (4) adherence to a philosophical
position, and (5) teacher's values. He concludes that the process-product research has produced no useful body of knowledge on which to base decisions. Further, he also concludes that choosing to use any of the first four items as bases for making decisions about how to teach requires that we first clarify our values. Otherwise inconsistent and contradictory teaching behaviour may result. He defines a value as "a belief or conviction that something is good or desirable" (p. 27), the something in this case being the fundamental aspects of education. He see these fundamental aspects as the elements of education--the learners, subject matter, and the teacher, and their interrelationships, and the aims of education--socialization, development, or liberation. Major questions to be asked about the elements of education include: "(1) what are the learners like? (2) how should subject matter be treated? and (3) what role should the teacher assume in the classroom setting?" (pp. 27-28). Answering each of these questions requires answers to a number of minor questions. Aims and elements are integrally related, and must be considered together in the development of any useful value position.

In summary, Zahorik (1977) identifies beliefs about: (1) learners, (2) content, (3) teachers, (4) the interrelationships between them, and (4) the aims of education.
Summary

Despite the newness of this research and the limited amount of work conducted to date, the results indicate that teachers do hold implicit theories and belief systems about teaching (thought structures) which influence their thought processes and actions. Beliefs were found to vary among individuals in their content and orientation, although several of the studies suggest that a teacher’s implicit theory of teaching can be described in terms of relatively few (three to eight) interdependent elements or beliefs (Dall’Alba, 1991; Fox, 1983; Kloss, 1987; Larsson, 1983, 1984; Martin & Balla, 1991; Menges & Rando, 1989; Pratt, 1990, 1992; Samuelowicz & Bain, 1992).

Each of the different groups of studies identified one or more groupings of beliefs about teaching. In summary, these groupings include beliefs about: (1) learners; (2) teachers; (3) subject matter content or knowledge; (4) the aims of learning, teaching and/or education; (5) teaching; (6) learning; (7) the teaching-learning transaction; and (8) the interrelationships between one or more of teacher, learners, content, context, and the ideals of education.

Two of the researchers explicitly state that each of the conceptions of teaching identified will be valuable in different contexts (Fox, 1983; Pratt, 1992), and that each of them is equally valid. Other researchers see the conceptions which they identified either as hierarchical (Dall’Alba, 1991; Martin & Balla, 1991) or as ordered (Samuelowicz & Bain, 1992). Those who see them as hierarchical understand each higher level
conception to encompass all of the beliefs of the lower conceptions. Those who understand conceptions to be ordered see them as composed of various continua of dimensions of beliefs, with the combinations of the chosen locations on the dimensions establishing the overall conceptions. Additional research is necessary to further clarify these issues.

More and more recent research is identifying the importance of the context to the establishment, development, and change or lack of change in teachers' beliefs about and actions when teaching. Some researchers postulate that teachers may have two sets of beliefs about teaching: an ideal belief system coincident with their views about the aims of education, and a working conception applicable to the context in which they teach (Menges & Rando, 1989; Samuelowicz & Bain, 1992; Zeichner & Tabachnick, 1985; Zeichner, Tabachnick & Densmore, 1987). One study (Richardson et al., 1991) identified the possibility that inconsistency between actions and beliefs is an indication that teachers may be in the process of changing their beliefs about teaching. Further research looking at the process of changing beliefs and actions, and at the various conceptions of teaching held by teachers, is needed.

Dall'Alba (1991) postulates that beliefs about teaching may not be totally context or subject related: she finds that some teachers in different content areas and contexts share similar conceptions of teaching. Conversely, Samuelowicz and Bain (1992) are able to identify distinctly different conceptions of teaching, varying dependant on the level of the
students, for two post-secondary teachers. Further research is needed to determine the influence of context and the extent of overlap among conceptions of teaching held by teachers working in different contexts.

Some research has identified the importance of positive contextual influences in the operation of a teaching training program, where that program is intended to help beginning teachers articulate and clarify their beliefs about teaching (Holt & Johnston, 1989).

A majority of teaching assistants in one study (Menges & Rando (1989) rely on generalized prior knowledge to diagnose teaching problems, rather than seeking situationally specific information. The strength and influence of existing schemas from other contexts on actions in situations where specifically context-related thought structures have not yet been created may be overlooked.

The majority of the research reaffirms the integral relationship between thinking and actions, beliefs and practice. Congruency between beliefs and actions is seen as essential to the practice of consistent and non-contradictory teaching, regardless of the conceptions of teaching held by the teacher.

**General discussion**

An underlying assumption of this type of research is that teachers construct their own thought structures about teaching, using their other existing schemas to do so, in ways
which are meaningful, coherent, and useful for them (Hewson & Hewson, 1989; Richardson, Anders, Tidwell & Lloyd, 1991). Constructivism suggests that teachers are active, purposeful, adaptable, self-aware, and knowing beings whose knowledge and goals influence and have consequences for their actions (Magoon, 1977). Their existing thought structures guide the interpretation and integration of new knowledge to create meaning. This perspective assumes that teachers, therefore, can be expected to hold differing conceptions of teaching, and that their conceptions of teaching will be refined, revised, and/or reconstructed through thought and experience.

Based on this assumption, researchers see identification of differing teaching beliefs as contributing to our overall knowledge of teaching by providing a more fundamental understanding of the belief aspects of teachers' thought structures. Because of the relationship between thought structures, thought processes, and actions (Ernest, 1989), a better understanding of thought structures is expected to improve our understanding of why teachers behave as they do (Ernest, 1989; Hewson & Hewson, 1989; Pratt, 1992).

Some research implies that whether and how teachers adopt or adapt proposed new teaching practices relates to whether their beliefs are consistent with those underlying the proposed changes (Hollingsworth, 1989; Munby, 1984; Richardson, Anders, Tidwell & Lloyd, 1991). If this is so, improving our understanding of teachers' beliefs about teaching and of processes for articulating those beliefs can be expected to be
of benefit in the development and implementation of both effective teacher education and new educational programs.

Further, many researchers view the articulation of conceptions of teaching as assisting teachers to move from implicit and privately held belief systems to explicit descriptions of their cognitive frames of reference (Dall’Alba, 1991; Fox, 1983; Martin & Balla, 1991; Menges & Rando, 1989; Pratt, 1990, 1992; Samuelowicz & Bain, 1992). Benefits thus exist for individual teachers to improve their teaching, since the research suggests that those teachers who have reflected deeply on the teaching and learning process, who understand their own conceptions and are aware that others exist, will be in a better position to choose appropriate actions for specific situations, and to resolve differences among those involved in the educational process.

McNamara (1990) and Kagan (1988) hold alternative views of the potential benefits of this research for improving teaching. McNamara (1990) believes that "teachers should be thoughtful and reflective practitioners" (p. 147), but questions whether research on teacher thinking will be of practical benefit in this regard. He cites seven concerns about the research, which are reviewed and discussed below.

First, an assumption is made by many researchers that thinking about teaching is an independent activity "which can be investigated and subsequently taught to intending teachers" (p. 149) out of the context of actual teaching. The importance of context, and the need to consider it in this research, is also a concern held and being addressed by Zeichner (1986),
Ernest (1989) and Hewson and Hewson (1989), among others. Thus, while McNamara's (1990) concern is valid with respect to some research, other researchers are beginning to address this issue.

Second, McNamara (1990) questions whether stopping and thinking may not lead to "paralysis or an inclination not to act" (p. 149), with significant consequences. While this may occur in some instances, acting without thinking can have equally dire results.

Third, problems with much of the developing methodology of this research leave researchers open to the danger of redescribing teachers' beliefs in words that are not their own. McNamara (1990) believes that this will alienate teachers, reducing the possibility that they will see some benefits for their practice from the research. This is an issue of concern in many areas of qualitative research, and has led to the use of participants' own words as data as much as possible, both in the analysis and the writing up of the results of the research.

Fourth, he questions the lack of investigation of teachers' thoughts about "how to teach subject matter so as to promote learning" (p. 151). Again, this is a concern also echoed by Zeichner (1986), with reference to the investigation of thoughts about teaching content. Some researchers have done work in this area (Shulman, 1986; Wilson, Shulman & Richert, 1987), while others are beginning to do so (Dall’Alba, 1991; Samuelowicz & Bain, 1992; Zeichner, 1986).

Fifth, McNamara (1990) is concerned with the lack of empirical research demonstrating that thoughtful reflective
teachers are necessarily better practitioners. Much of the research has investigated the quality of teachers' thinking in detached situations, away from the actual context of their teaching. The mere fact that teachers are good at reflecting about their teaching after it occurs does not mean that they are good at implementing the results of their reflections in the context of their own teaching. More research is needed in this area.

Sixth, any evaluation of the quality of a teacher's thought "may be shaped by the educational values or beliefs of the judge . . . [which] may clash or mesh with the educational beliefs of the practitioner" (McNamara, 1990, p. 151). This is a concern identified by Pratt (1992) as well. However, it can also be considered a valid reason to continue with research which identifies different conceptions of teaching, since the more we know about different beliefs about teaching, the more they can be taken into account in all evaluation situations.

Lastly, McNamara (1990) is concerned with the focus of the research, and any subsequent implications for practice, on the thinking of individual teachers, when making changes within the educational system is "notoriously difficult [for] individual practitioners" (p. 153). While this is often the case, it can also be argued that the more individuals become concerned with an issue, the more likely are they to be able to work together to implement changes in the system.

Despite these questions, McNamara (1990) believes that the contribution of research on teacher thinking is "that it may be read and understood in a way which identifies factors
which teacher-educators should consider in order to achieve the goal of promoting reflective teaching" (p. 153). He summarizes these factors in a set of seven guidelines for teacher-educators, focusing both on form and on substance.

Kagan (1988) has examined the analogy of teaching as clinical problem solving, comparing an early uni-dimensional, linear model with a more recent segmented, multi-dimensional one. She finds that the possible variations in the multi-dimensional model may explain some of the differences in how teachers define 'good teaching.' Rather than attribute the lack of consensus to disagreements about ideology, as does Zahorik (1986), she believes that "disagreement may be attributable simply to the variety of possible shapes the model will accommodate: it is unlikely that any teacher could experience them all, even during the course of a long career" (p. 496). Further research is necessary to clarify the basis for different understandings of teaching.

This section has discussed and responded to several current criticisms of research on the belief aspects of teachers' thought structures. More specific methodological criticisms are addressed in Chapter 3. Despite many outstanding questions, this research is contributing to our growing understanding of teachers' beliefs about teaching, utilizing teachers' own conceptualizations, expressed, in many cases, in their own words.
The final section of this chapter presents a preliminary framework of dimensions developed from this selected literature for differentiating beliefs about teaching. This framework provides a basis against which to compare the constituent dimensions for differentiating global conceptions derived from the data.

Differentiating Beliefs: A Framework

As indicated above, researchers interested in beliefs about teaching have focused on aspects of teachers' thought structures which often overlap, but are not identical. The notions of conceptions of teaching and teaching perspectives overlap, for example.

Teaching perspectives are understood to exist in relation to specific teaching situations (Tabachnick & Zeichner, 1984). Researchers investigating perspectives are particularly concerned with the influences on teachers' perspectives of the context within which they work. With conceptions, some researchers see them specifically as conceptions of teaching a particular subject--mathematics, reading, or science, for example--influenced by that content and context (Hewson & Hewson, 1989; Richardson, Anders, Tidwell & Lloyd, 1991; Samuelowicz & Bain, 1992). Others believe that similar conceptions of teaching can be held by teachers working with different content, in different contexts (Dall' Alba, 1991; Pratt, 1990, 1992). Yet with both perspectives and conceptions, concern for the relationship of thoughts to
actions exists. Thus there are areas of similarity and areas of difference between perspectives and conceptions. Other examples of overlap occur between implicit theories and conceptions, images or mental models and beliefs, and beliefs and values.

Comparing and contrasting these ideas about the belief aspects of teacher thought structures is difficult. The terminology varies; each term has slightly different definitions and boundaries. The aspects of thought structures investigated, and the foci of the research, overlap in some areas, but not in all. Finally, the frameworks used to describe and/or explain the results vary. Such variety is valuable, since research into teachers' thought structures is still exploratory, and we do not yet thoroughly understand teachers' schemas. While ensuring that many aspects of thought structures are examined, however, this lack of standardization also makes comparison and integration of results problematic and complex.

In an attempt to reduce this difficulty, Samuelowicz & Bain (1992) developed a process for classifying conceptions which they see as increasing the possibility of "establishing correspondence between the claims of different researchers" (p. 16). Using a phenomenographic approach, they begin by identifying global conceptions from the data. They then compare and contrast these conceptions to extract dimensions "that can be used to delimit qualitatively different conceptions of teaching" (p. 16). The same dimensions are used to define all
conceptions. The internal consistency of the global conceptions is cross-validated by the dimensions.

To demonstrate the process, Samuelowicz & Bain (1992) identify dimensions from their data and from the published results of four other researchers. They then discuss and evaluate the similarities and differences among these dimensions and their related global conceptions, reducing the total number of separate dimensions to seven. In their understanding, "there are relatively few dimensions by which qualitatively different conceptions of teaching can be defined, and . . . a conception is a unique combination of these dimensions" (p. 18). The seven dimensions which they identified following their research and review of the four other articles include

- teachers' and students' role or one-way communication versus interaction;
- theories of learning or expected outcomes of learning;
- students' current understanding/students' existing conceptions;
- ownership of knowledge;
- subject content versus changing students' conceptions, attitudes, skills;
- subject versus world knowledge;
- teacher versus student control of subject matter. (p. 18)

This process is similar to one developed by Tabachnick and Zeichner (1984) in their investigation of the teaching perspectives of student teachers. They identified eighteen dilemmas related to four orienting categories of perspectives--knowledge and curriculum, teacher - pupil relations, teacher role, and pupil diversity--that all of their student teacher participants "recognized, discussed, and acted upon in their classrooms" (p. 31). The dilemmas are summarized below (p. 32):
Knowledge and Curriculum

1. Public knowledge--Private knowledge
2. Knowledge is product--Knowledge process
3. Knowledge is certain--Knowledge is problematic
4. Learning is fragmented--Learning is holistic
5. Learning is unrelated--Learning is integrated
6. Learning is individual--Learning is collective
7. Teaching control over pupil learning: High--Low

Teacher-Pupil Relationships

8. Distant--Personal
9. Teacher control over pupil behaviour: High--Low

The Teacher’s Role

10. In determining what to teach:
    Bureaucratic--Functional--Independent
11. In determining how to teach:
    Bureaucratic--Functional--Independent
12. In relation to school rules and regulations:
    Bureaucratic--Functional--Independent

Student Diversity

13. Children are members of a category--children are unique
15. Pupil behaviour: Universalism--Particularism
16. Allocation of school resources: Equal--Differential
17. School curriculum: Emphasis on common culture--emphasis on subgroup consciousness
18. Career orientation: Restricted--Little restriction

Through analysis of interview and observational data, Tabachnick and Zeichner (1985) defined each student teacher’s characteristic way of resolving each of the eighteen dilemmas. The teaching perspective of each student teacher was then described by a set of profiles constructed from her/his dominant modes of resolving the eighteen dilemmas.

The dilemmas used by Tabachnick and Zeichner (1985), with the exception of those in the teacher’s role category, are bipolar, as are the dimensions identified by Samuelowicz and Bain (1992). In some instances, teachers hold strongly delineated
beliefs located at one or the other of the two poles. Other teachers hold beliefs which incorporate both poles of the dimension/dilemma.

I follow an expanded phenomenographic approach similar to that of Samuelowicz and Bain (1992) in this research, using dimensions derived from the global conceptions to cross-validate the internal consistency of the conceptions. This process is discussed in more detail in Chapter 3. The value of the research is enhanced, and Samuelowicz and Bain's (1992) ideas further examined, through a comparison of the constituent dimensions derived from my data with tentative dimensions which I have identified from the literature reviewed above. The next section of this chapter presents these tentative dimensions.

**Possible Dimensions of Beliefs about Teaching**

Possible dimensions identified from the literature are classified under categories comprising the elements of teaching (Pratt, 1992) and the aims and elements of education (Zahorik, 1977). These include: (1) learners (their characteristics and the learning process); (2) subject matter or content (that which is to be learned); (3) teachers (responsibilities, functions, and the teaching-learning transaction); (4) aims or ideals (goals or purposes of teaching and/or education); and (5) context (situational factors external to the teacher and the learners which influence teaching and/or learning). Each dimension is a bi-polar continuum of beliefs. Neither the
categories themselves nor the dimensions identified in each category are prioritized.

**Learners, the Learning Process, and Learning Outcomes**

1) Learners' role in the teaching-learning process is a passive one of receiving knowledge, to learners' role is an active one of interpreting meaning (Apps, 1982; Dall'Alba, 1991; Entwistle & Tait, 1990; Ernest, 1989; Fox, 1983; Hewson & Hewson, 1989; Larsson, 1983; Pratt, 1990, 1992; Samuelowicz & Bain, 1992; Zahorik, 1991).

2) Learners are members of a category or group who behave similarly, whose prior knowledge, skills, experience and (mis)conceptions do not affect their learning and who are not problematic, to learners are dynamic and unique, exhibit diverse behaviours and learning styles, and have prior knowledge, skills, experience and (mis)conceptions which are important to their current learning (Apps, 1989; Borko, Lalik & Tomchin, 1987; Ernest, 1989; Fox, 1983; Goodman, 1988; Hewson & Hewson, 1989; Samuelowicz & Bain, 1992; Tabachnick & Zeichner, 1984; Zeichner & Tabachnick, 1985).

3) The learning is the responsibility of the teacher, who must motivate the students and make decisions for them, to the learners are responsible for their learning, are self-motivated and capable of making responsible decisions for themselves (Borko, Lalik & Tomchin, 1987; Entwistle & Tait, 1990; Pinnegar & Carter, 1991; Zahorik, 1978).

5) Learning is examination oriented and a prescribed requirement to learning is application oriented and personally relevant (Martin & Balla, 1991; Pratt, 1992; Samuelowicz & Bain, 1992; Zahorik, 1991).

6) Learning outcomes are expressed in quantitative terms (know more, that is the accumulation of factual knowledge or mastery of skills, a product, or achievement), to learning outcomes are expressed in qualitative terms (know differently, that is interpret the world differently or change one’s conceptual understanding, a process, or task) (Feiman-Nemser & Floden, 1986; Fox, 1983; Hewson & Hewson, 1989; Holt & Johnston, 1989; Pratt, 1992; Richardson, Anders, Tidwell & Lloyd, 1991; Samuelowicz & Bain, 1992).

Subject Matter/Content: What is to be Learned

1) Knowledge and meaning is stable, external to the learner, facts which can be transmitted from one person to another, curriculum bound, provided by the teacher, the text, or implicit in the material, teacher controlled, to knowledge and meaning is changing, created and constructed by the learner, an interpretation of reality, learner controlled (Apps, 1989; Martin & Balla, 1991;

2) Knowledge and meaning is certain and to be accepted, a product, to knowledge and meaning is problematic and to be questioned, a process (Apps, 1989; Pratt, 1992; Samuelowicz & Bain, 1992; Zeichner & Tabachnick, 1985).

3) Knowledge and meaning is to be presented from a common cultural viewpoint, to knowledge and meaning is to be presented from the viewpoints of different cultural subgroups (Tabachnick & Zeichner, 1984; Zeichner & Tabachnick, 1985).

Teachers and Teaching: Responsibilities, Functions and the Teaching-learning Transaction

1) Teachers and learners possess relevant knowledge; teachers consider learners’ prior skills, beliefs, experience and prior knowledge relevant to learning to teachers possess relevant knowledge; learners’ prior skills, beliefs, experience and prior knowledge are not relevant to learning (Fox, 1983; Pratt, 1990, 1992; Richardson, Anders, Tidwell & Lloyd, 1991; Samuelowicz & Bain, 1992; Zahorik, 1978).

2) The teaching-learning process is interactive/cooperative, emphasizing process and the construction of knowledge and meaning, with the teacher as a fellow learner, to the teaching-learning process is one way transmission of knowledge, emphasizing product, with the teacher as a content expert or role model (Apps, 1982; Dall’Alba,
3) Teaching is direct and directive, and teachers have a high level of control over learners' actions, to teaching is indirect and facilitative, with learners directing their own learning (Holt & Johnston, 1989; Martin & Balla, 1991; Pratt, 1992; Tabachnick & Zeichner, 1984; Zahorik, 1978, 1991; Zeichner & Tabachnick, 1985).

4) Creating a climate within which learners will be motivated to learn is important to a favourable climate for learning is not necessary and has no effect on students' learning (Ernest, 1989; Holt & Johnston, 1989; Martin & Balla, 1991; Pinnegar & Carter, 1991; Pratt, 1992; Richardson, Anders, Tidwell & Lloyd, 1991).


6) Teacher-learner relationships are distant, to teacher-learner relationships are personal (Calderhead & Robson, 1991; Pinnegar & Carter, 1991; Tabachnick & Zeichner, 1984; Zeichner & Tabachnick, 1985).

Aims and Ideals: Goals and Purposes of Teaching

1) The aim of teaching is to instill the accepted values of a discipline, profession or society to the aim of
teaching is to empower learners, encouraging them to question the existing values of a discipline, profession or society (Apps, 1989; Ernest, 1989; Goodman, 1988; Pratt, 1992; Zahorik, 1978).

2) The focus of teaching is on content—emphasizing the transmission of information and movement of learners through a predetermined curriculum in a pre-specified time period to the focus of teaching is on the learner—clarifying values, promoting intellectual growth and/or the building of self-esteem and self-concept (Apps, 1982, 1989; Bullough & Knowles, 1991; Ernest, 1989; Goodman, 1988; Martin & Balla, 1991; Pratt, 1992; Zahorik, 1978).

Context: External Factors Influencing the Teaching-learning Process


2) Resources are allocated equally to all learners, to resources are not allocated equally to all learners (Tabachnick & Zeichner, 1984; Zeichner & Tabachnick, 1985).

As stated earlier, no attempt has been made to prioritize either the categories into which the dimensions presented above are arranged, or the dimensions themselves. Previous work
concerning these categories—learners, content, teachers, context, and the aims of education—primarily considers them as being of similar, if not equivalent levels of importance in the teaching-learning transaction (Apps, 1989; Joyce & Weil, 1986; Pratt, 1992; Zahorik, 1977, 1978). Neither Tabachnick and Zeichner (1984) nor Samuelowicz and Bain (1992) prioritize the dilemmas or dimensions identified. Rather, the dilemmas or dimensions are used to create profiles of the perspectives or conceptions held by the teachers participating in the research.

Samuelowicz and Bain (1992) prioritize the conceptions thus classified in terms of the combination of dimensions which make up the profile of each conception. Their prioritization of the conceptions on this basis is ordered, not hierarchical. However, other researchers have prioritized conceptions hierarchically (Dall’Alba, 1991; Martin & Balla, 1991), while some (Fox, 1983; Pratt, 1992) consider all conceptions to be equally valid. The context within which the conceptions are held is considered by some researchers to influence the conceptions held (Ernest, 1989; Samuelowicz & Bain, 1992), and their validity (Fox, 1983; Pratt, 1992). At the same time, some researchers question whether conceptions are not context-independent (Dall’Alba, 1991), while still others do not discuss context (Martin & Balla, 1991). The differences in the conclusions reached by these different researchers indicate the need for further research.
Summary

This chapter has 'set the scene,' weaving together meaningful strands of relevant literature to establish the context for this research. The strands include teaching assistants and their teaching context, the psychological foundations of teaching—thought structures and thought processes—and their relationship to teaching actions, and recent research examining beliefs, and changes in beliefs, about teaching. The chapter concludes by presenting possible dimensions of beliefs about teaching identified from the literature. These dimensions comprise a preliminary framework against which the dimensions extracted from the conceptions identified in this research are compared and contrasted in Chapter Five.

This chapter has summarized and discussed relevant concepts and research related to the belief aspects of thought structures about teaching. Chapter Three reviews the design of the current research.
The outcome of our research is not technical knowledge of the kind which lays down set procedures or prescribes fixed courses of action: it is hermeneutic or interpretative knowledge, but it is also related to a particular range of situations and is thus contextual in nature. The results are intended to improve people's understanding of those particular aspects of the world which we have been investigating, or ones with very similar characteristics. The effects of our research findings could have an 'emancipatory' potential if the insights presented by the research help others to improve their own circumstances and realize their potentialities more fully.

Noel Entwistle & Ference Marton
Changing Conceptions of Learning and Research

The purpose of this chapter is to discuss the methodological background of this research; to examine the research approach used, which is phenomenography; and to describe the design of the work; the research process; data collection; and data analysis. I approach this research with a broad interest in understanding what graduate teaching assistants (TAs) believe about teaching, and whether, and if so in what ways, their conceptions change over time. As with other research into the thought structures of individuals who teach, the objective is "to make explicit and visible the frames of reference through which individual [teaching assistants] perceive and process information" (Clark & Peterson, 1986, p. 287). The research is exploratory and descriptive. The emphasis is on exploring the similarities and differences among conceptions of teaching held by this group of
teaching assistants on three occasions. The initial step in such an exploration entails "describing people's experiences of reality" (Gibbs, Morgan & Taylor, 1982, p. 141) as much as possible as they perceive and understand them, not just as I, as a researcher, perceive and understand them. This research is constructivist inquiry, undertaken using a qualitative approach.

Research Method

Constructivist Inquiry

Two sets of concepts form the basis for the constructivist (often called interpretivist or naturalistic) inquiry paradigm in science, "which taken together provide a strong rationale for it as a research paradigm" (Owens, 1982, p. 5). These sets of concepts are: (1) the naturalistic-ecological hypothesis, and (2) the qualitative-phenomenological hypothesis.

The naturalistic-ecological hypothesis postulates that the contexts in which they occur so influence human actions that regularities in those contexts are more powerful in shaping human behaviour than differences among the individuals involved (Krefting, 1991; Owens, 1982). Further, the world we wish to understand is such an inter-related, dynamic system that one element inevitably affects all others, and separation of one element from the rest distorts the system. Thus, to understand human behaviour in particular contexts, research is
best conducted in those contexts where the forces influencing the individuals occur, and where the parts can be investigated in the context of the whole (Goetz & LeCompte, 1984; Owens, 1982).

The concepts comprising the qualitative-phenomenological hypothesis hold that human actions cannot be comprehended without understanding the framework used by the individuals involved to interpret their environment (Goetz & LeCompte, 1984; Krefting, 1991; Owens, 1982). What individuals believe to be true is considered to be more important than any objective reality; their behaviour is based on what they believe, and they experience consequences to their actions (Fetterman, 1988). We can best understand this framework by understanding the participants' "thoughts, feelings, values, perceptions, and . . . actions" (Owens, 1982, p. 5).

Another way to conceive of the paradigm of constructivist inquiry is to consider constructivism using the categories with which we examine assumptions underlying the paradigms of positivism, post-positivism or critical theory. Generally, and without becoming involved in a long analysis and comparison of the four paradigms, they can be distinguished "by the way their proponents respond to three basic questions, which can be characterized as the ontological, the epistemological, and the methodological questions" (Guba, 1990, p. 18, emphasis in original). These three questions, the constructivist responses to them, and their relationship to this research, are discussed briefly below.
Ontological Question

The ontological question at issue is "what is the nature of 'the knowable'?" Or "what is the nature of 'reality'?"

Constructivists are relativists, who assume that multiple, intangible realities exist as constructions of individuals' minds, unfolding and changing over time as people interact with events, objects and processes in their social worlds (Firestone, 1987; Lincoln, 1990; Owens, 1982; Stalker, 1989). These constructions are holistic and meaning-bound, dialectical, and both inter- and intra-personally conflictual (Guba, 1990; Lincoln, 1990). As realities, they are "socially and experientially based, local and specific, dependent for their form and content on the persons who hold them" (Guba, 1990, p. 27). Individuals' realities--the interpretations of and meanings attributed to the events, objects and processes with which people interact--constitute the sphere of interest for researchers investigating social and behavioral phenomena (Guba & Lincoln, 1986).

Because human conduct is never time or context free, constructivists believe that it is not useful to try to generalize about human behaviour, particularly about cause and effect relationships (Lincoln, 1990; Owens, 1982). The constant and mutual interaction and change of processes, events and factors in human relationships makes the establishment of cause and effect problematic. Constructivists instead accept "the parallel concept of mutual simultaneous shaping, arguing
that any particular inference about the nature of that shaping is [researcher] purpose dependent and time and context bound" (Guba & Lincoln, 1986, p. 148).

Because generalizations are problematic, constructivists consider differences to be as inherently important as similarities, in some cases more so. The aim of inquiry is therefore to create knowledge "usually expressed in the form of pattern theories, or webs of mutual and plausible influence expressed as working hypotheses, or temporary, time- and place-bound knowledge (Lincoln, 1990, p. 77). These working hypotheses may be transferable from one context to another, depending on the similarity of the contexts and the individuals or groups being investigated (Goetz & Lecompte, 1984; Guba & Lincoln, 1986). Further, assembly of numerous corroborative sources of data over a sizable period allows induction and the making of sequential logical inferences (Goetz & LeCompte, 1984).

In this research, I inquire into the multiple beliefs about teaching held by nine teaching assistants working in specific contexts. I also explore whether, and if so in what ways, those beliefs change over time. I do not, nor did I intend to, establish a cause and effect relationship between participation in the teaching training programs and changes in beliefs about teaching; the extent of the interactional influences among the events, individuals, factors and processes involved is too complex. Rather, I explore and describe the
variety of beliefs about teaching which the teaching assistants hold in different contexts and at different times. In doing so, I focus on the differences, as well as the similarities, among their beliefs about teaching.

Given that there are some similarities in all teaching contexts, the research contributes to our knowledge base of beliefs about teaching held by those who teach, providing another corroborative source of data. Simultaneously, it begins, together with the study of Menges and Rando (1989), to create a body of knowledge about the teaching beliefs of teaching assistants, who, to some extent, work in different contexts from others who teach.

Epistemological Question

The epistemological question at issue is "what is the nature of the relationship between the knower (the inquirer) and the known (or knowable)?"

Constructivists believe that the interaction between the inquirer and the respondent inevitably influences both, whether the interaction involves unstructured verbal discussions or the completion of some apparently objective paper and pencil instrumentation (Goetz & LeCompte, 1984; Guba, 1990). It is impossible to eliminate this interaction. Research findings are always shaped by it; thus it should be capitalized on because "it is precisely the interactivity that makes it possible for the [researcher as] human instrument to achieve maximum
responsiveness, adaptability, and insight" (Guba & Lincoln, 1986, p. 148). Knowledge is a human construction, dynamic and ever problematic, and objectivity is not possible. Given this, constructivists are subjectivists, who see "what can be known and the individual who comes to know it [as] fused into a coherent whole" (Guba, 1990, p. 26). The researcher and the subject of the research cannot be separated (Oberle, 1991). Further, because realities exist only in individuals' minds, subjective interaction is the only means of accessing these constructions (Guba, 1990; Lincoln, 1990).

Individuals' actions are based on their values and beliefs. Interactions between the inquirer and the participants influence research. Therefore the values underlying those interactions also influence research. Research is never value free (Guba, 1990; Guba & Lincoln, 1986; Lather, 1990; Lincoln, 1990). Indeed, values affect research "in the choice of a problem, the choice of an overall design strategy, the choice of the setting, and the decision to honour and present the values that inhere in the site(s)" (Lincoln, 1990, p. 78). Consequently, constructivists believe that values must be discussed and explored throughout the research process and as part of the research product(s). This explication is intended to eliminate the possibility of dissonance among values leading to ambiguous results, which many constructivists believe has occurred frequently in social and behavioural research conducted in the positivistic paradigm (Lincoln & Guba, 1985).
In this research I, as the research instrument, take a subjective stance, and capitalize on the interactivity between me and the participants. Our interaction includes long semi-structured interviews and limited observations of their teaching. To decrease the possibility of value dissonance affecting the research results, wherever possible I outline my values and the value decisions made during the course of this investigation.

**Methodological Question**

The methodological question at issue can be stated as "how should the inquirer go about finding out knowledge?"

The goal of researchers working in the constructivist paradigm is to identify the different existing constructions, "bringing them into as much consensus as possible . . . [and thus] reconstruct[ing] the 'world' at the only point at which it exists: in the minds of the constructors" (Guba, 1990, pp. 26-27, emphasis in original). Constructivist researchers search for understanding and common meaning (Oberle, 1991). Given the assumptions concerning the time- and context-bound nature of realities on which the paradigm is based, constructivist inquiry is carried out in natural contexts, using methods designed "to capture realities holistically, to discern meaning implicit in human activity, and to be congenial to the human-as-instrument" (Lincoln, 1990, p. 78). Such methods are commonly, although not always, qualitative.
The design for the inquiry emerges as the research proceeds, since each succeeding step is dependent on the emergence of salient issues from what has gone before (Goetz & LeCompte, 1984; Guba & Lincoln, 1986; Lincoln, 1990). Theory emerges from the data themselves; the orientation of the methods is toward discovery or generation of theories, rather than toward verification of existing theories (Glaser & Strauss, 1967; Goetz & LeCompte, 1984; Lincoln, 1990; Reichardt & Cook, 1979). Methods are at one and the same time hermeneutic and dialectical, concerned with conflict as well as consensus (Guba, 1990; Lincoln, 1990; Smith & Leshusius, 1986). They are focused on depicting accurately the existing constructions, while "keeping the channels of communication open so that information and sophistication can be continuously improved" (Guba, 1990, p. 27).

The methodology I use for this research is phenomenography, a qualitative approach developed in Gothenburg, Sweden, in the late 1970s. Phenomenography is oriented toward discovery rather toward verification of existing theories. In this research, my goal is to explore the different constructions of the phenomenon of teaching, using a hermeneutic and dialectical approach. I want to identify the meaning implicit, for these TAs, in the human activity of teaching.

Phenomenography is considered by Fetterman (1988) to be a novel approach to qualitative research, with roots in the
classic qualitative approaches, yet standing between them and research approaches based on the mainstream positivist paradigm. It is discussed in detail below.

**Phenomenography**

**Definition, Objectives and Perspective**

Phenomenography is "a research specialization aimed at the mapping of the qualitatively different ways in which people experience, conceptualize, perceive, and understand various aspects of, and various phenomena in, the world around them" (Marton, 1988b, pp. 178-179). The rationale underlying this type of research is that individuals act on their interpretation of the circumstances in which they find themselves, rather than on the objective features of situations (if they could be established) (Saljo, 1988). The goal of phenomenography is to describe "the world as perceived, . . . [not] the world as it is" (Gibbs, Morgan, & Taylor, 1982, p. 139).

In doing this, phenomenographers distinguish between a first order perspective and a second order perspective of formulating research questions (Marton, 1981, 1988b). A first order perspective focuses on, and makes statements about, various aspects of the world. A research question from this perspective might ask 'why do teachers have different beliefs about teaching'--a question about the world. A second order perspective concerns itself with people's ideas about, and
experiences of, aspects of the world, and makes statements about those ideas or experiences. It aims to describe people's experiences of their reality. Boud & Walker's (1990) definition of experience is useful in understanding this goal. They consider experience to be "an interaction between a [person] and a social, psychological and material environment or milieu. . . . [T]he experience is the situation as it is known and lived by the [individual]" (p. 62). A research question from this perspective might ask 'how is the phenomenon of teaching understood by teachers'--a question about people's conceptions of the world.

A second order perspective is fundamental to the notion of phenomenography. It explores 'what' is understood by the respondents rather than 'how much' of something is perceived or 'how' the perception is created. Gibbs, Morgan and Taylor (1982) distinguish between the two views:

The 'how much' question relates exclusively to those situations where that to be studied is already defined. In order to measure something you must know what 'it' is. But within the 2nd order perspective, what 'it' is is the focus of attention. Within the 1st order perspective, this is taken for granted. (p. 140)

**Characteristics**

In exploring what 'it' is--what is understood--phenomenography is experiential, relational and contextual, content-oriented, and qualitative. It is concerned with the world as the respondents experience it--their individual-world relationships--rather than with the world as a researcher observes it from the outside. That individual-world
relationship "forms the context within which people develop the reasonings around their actions" (Stalker, 1989, p. 38). Phenomenography is not concerned solely with a phenomenon, like teaching, nor simply with people, as for example, teachers. Instead, it focuses on the relations between the two—the individual and the phenomenon as experienced and constructed by the person. Phenomenography characterizes how phenomena appear to people—how they experience them—through the content which is perceived or thought about. Thus in each conception "there is an act of conceptualization [the how] and there is something conceptualized [the what]; the two aspects are simply inconceivable without each other" (Lybeck, Marton, Stromdahl & Tullberg, 1988, p. 101). Conceptions have been found to vary among contexts, and among historical periods (Ramsden, 1988a; Saljo, 1988).

Phenomenographic research is qualitative (Marton, 1988b) and is very much an act of discovery (Gibbs, Morgan & Taylor, 1982). Researchers try to look with the respondents and to see the world as they see it, to gain insights into how things look to the respondents (Saljo, 1988). In doing this, they look for the variations in people's understandings of a phenomenon, rather than for the essence or invariant meanings which people share about the phenomenon. While they do not seek common meanings, neither are they concerned with idiosyncratic variation (Stalker, 1989). Instead, they have empirically determined that there exist, between the common and the idiosyncratic, a relatively limited number of qualitatively
different ways of viewing, experiencing or conceptualizing a phenomenon (Beaty, 1987; Beaty, Dall’Alba & Marton, 1990; Marton, 1981, 1983, 1986, 1988a, 1988b; Marton & Saljo, 1976; Marton, Hounsell & Entwistle, 1984; Pratt, 1990, 1992; Ramsden, 1988a; Saljo, 1981; Samuelowicz & Bain, 1992). Individuals are not entirely free to construct whatever conceptions they want, since their physical and social worlds restrict their variation in conceptions. Thus a limited number of conceptions are said to exist (Stalker, 1989).

Global Conceptions as Research Findings

In phenomenography, the goal of the researcher is to describe the different ways in which aspects of the world are perceived by the respondents (Gibbs, Morgan & Taylor, 1982; Stalker, 1989). Conceptions, "abstract, cognitive representations of a phenomenon" (Pratt, 1992, p. 220), are thought structures, 'filters' through which individuals interpret their world.

Any individual may hold multiple and/or contradictory conceptions. Similarly, conceptions may vary among individuals. Respondents' conceptions may change with the context in which they find themselves (Saljo, 1988), and may also vary with, for example, new learning or experiences (Marton, 1981).

This variation in conceptions is important, because phenomenographers' primary concern is not with the mere listing of different conceptions. Rather, they are interested in the
discovery of some logical relationship between the global conceptions (established by the researcher), corresponding to the different conceptions of the phenomenon in question (held by the participants) (Lybeck, Marton, Stromdahl & Tullberg, 1988). The focus is on discovering and mapping the variation of conceptions as sets of distinctive global conceptions, where each global conception corresponds to a particular conception of a given phenomenon (Marton, 1984). Respondents' descriptions of the phenomenon are characterized and systemized, and these characterizations or global conceptions are seen as the main outcomes of phenomenographic research.

Phenomenographers see conceptions as characteristics of ways of functioning. Thus they find it useful "to think in terms of an abstract system of description, a gigantic space of [global conceptions] in which the individuals move--more or less freely--back and forth" (Marton, 1984, p. 62). This space of global conceptions is called an outcome space, and can be considered as a structural map of the variations in conceptions of many individuals. It is possible, but unlikely, for all variations to exist in one individual. As discussed above, phenomenographers have empirically demonstrated, consistently, that when conceptions are organized into global conceptions, a limited number of qualitatively different characterizations of a phenomenon are found. This set of global conceptions is "thus stable and generalizable between situations, even if the individuals 'move' from one . . . to another on different occasions" (Marton, 1984, p. 62). Following their
identification, the global conceptions may be used "to describe similarities and differences in the conception of the phenomenon in question within and between individuals" (Beaty, Dall’Alba & Marton, 1990, p. 38). Further, the global conceptions are related to other global conceptions, and thus are potentially parts of larger structures (Marton, 1988b).

Phenomenography can be compared to a research project aiming to describe

the previously unknown flora on some distant island. The finding and describing of new species would correspond to the aim of finding and describing the different ways in which people may think about a certain aspect of reality. (Marton, 1988b, p. 183)

As in the case of describing new species, then, a set of global conceptions describing different thought structures is considered to be the main result of phenomenographic research. A lack of standardization in defining these global conceptions strongly influences the ability of researchers to compare findings from different studies investigating conceptions of the same phenomenon. This research advances beyond most other phenomenographic work with the extraction of standard constituent dimensions from the global conceptions identified; profiles of these common dimensions are then used to define the global conceptions. Derivation of the tentative framework of dimensions from the literature constituted a similar initial attempt to define the groups of beliefs identified by other researchers. The results of a comparison between this framework and my research findings are discussed in Chapter Five.
Comparison with Other Qualitative Research Methods

Many qualitative research methods exist. Two of the most widely used and understood in the social sciences are ethnography and phenomenology. Phenomenography can be further understood when compared with these more common qualitative methods. Although all three are relational and contextual, experiential, and content-oriented, differences do exist between them. The differences are primarily to do with research interests and with implicit or explicit theories of description (Marton, 1988b).

Ethnography and phenomenography.

Ethnography is concerned with understanding the perspective of the people being studied, and with observing their activities in daily life (Hammersley & Atkinson, 1983). It has been defined as "an analytic description of an intact cultural scene . . . , delineating the shared beliefs, practices, artifacts, folk knowledge, and behaviours of some group of people. Its objective is the holistic reconstruction of the culture or phenomena investigated" (Goetz & LeCompte, 1984, p. 244). Extensive observations of participants' lives in context are the norm to ensure faithful and accurate descriptions of the participants' life world.

Phenomenographers are interested in people's understandings of specific phenomena as aspects of their life world. While believing that meaning is always contextual, they consider some aspects of a context to be relevant in relation to particular questions, while others are not (Marton, 1988b).
Their task is to discern the most significant aspects of the whole context. Thus it should, in principle, be possible to study people's understandings of those phenomena through semi-structured interviews, although interviewing is not an essential aspect of phenomenography; it is simply the most commonly used method (Marton, 1988b). Phenomenographic research based primarily on participant observation has also been conducted (Marton, 1988b).

Phenomenographic results—global conceptions denoting the qualitatively different conceptions—are usually presented in some form of hierarchy. Phenomenographers believe that some conceptions may be more useful in some contexts than others. Thus, "there is a 'best' conception, and sometimes the other conceptions can be ordered along an evaluative dimension" (Marton, 1988b, p. 195).

Ethnography eschews hierarchies, and focuses rather on rich, natural descriptions. These descriptions are used to depict the researchers' new understandings of intact cultural scenes or groups for those who do not belong to the culture under investigation (Goetz & LeCompte, 1984).

Recently, ethnography has become concerned with the principle of reflexivity (Hammersley & Atkinson, 1983), or the ways in which the researcher and the research methods affect the findings (Marton, 1988b). Consideration of these effects is an essential part of ethnomethod analysis.

Phenomenographers agree that it is important to analyze how research methods affect the phenomenon under investigation.
However, the basic idea of phenomenography is that all phenomena can be experienced or conceptualized in a limited number of qualitatively different ways. Phenomenographers see their research task as mapping these possible understandings, and consider the effect of the research method used to be "relevant to the extent that it limits the variation obtained" (Marton, 1988b, p. 196). The extent to which the research affects the conception exhibited by a participant in a particular context is accepted as an important question, but is considered to be one that is "definitely outside the heart of the phenomenographic enterprise" (Marton, 1988b, p. 196).

Thus most ethnographers aim at holistic reconstruction of an intact culture or group, producing rich, natural "thick" description as research results. Phenomenographers aim to identify a limited number of qualitatively different ways in which people understand an aspect of their culture, producing logically related global conceptions as findings.

**Phenomenology and phenomenography.**

The goal of phenomenology is to understand a phenomenon more fully and deeply by returning to the lived experience itself (Van Manen, 1990). It asks the simple, first order question "what is it like to have a certain experience?" (Van Manen, 1990, p. 152), and understands knowledge to speak to us through our lived experiences. It is essentially a first person enterprise.

Phenomenographers ask the question from a second order perspective, 'what do people think it is like to have a certain
experience?" Further, phenomenography is not intended as a first person enterprise.

Phenomenologists aim to "depict the basic structure of our experience of various aspects of reality, to make us conscious of what the world was like before we learned how to see it" (Marton, 1988b, p. 193). Meaning is derived from experience, but can only be assimilated or understood through reflection (Carpenter, 1991). The researcher is to become immersed into the world of the subject without preconceived ideas or theories, to be able to experience afresh the phenomenon under study. The notion of "bracketing" or holding in check preconceived ideas is an attempt to avoid the influence of the researcher's prior views and understandings on the results.

The researcher's prior knowledge is important to phenomenography; "one of the prerequisites for analyzing data is that the researcher is acquainted with the subject matter in question" (Saljo, 1988, p. 41). Conceptions are described in terms of their content; without understanding of that content, the global conceptions and their inter-relationships cannot be identified.

Phenomenology focuses on the essence of experiences. The essence "is usually interpreted as that which is common to different forms of experience" (Marton, 1988b, p. 193). Phenomenographers try to characterize the variations of experience and understanding into global conceptions.
Yorke (1990) has distinguished between the two in diagrammatic form, in his consideration of possible avenues of exploration for a researcher interested in "the understanding and interpretation of action (.... [where action] includes behaviour in the relevant professional setting and the acts of articulation about behaviour)" (Yorke, 1990, p. 44). Although it illustrates only some of the points discussed above, his diagram provides an eloquent summary of several of the differences between phenomenology and phenomenography.
Phenomenology and phenomenography in a researcher's construing of an event (Yorke, 1990, p. 45).

Summary

Phenomenography is "one attempt to deal explicitly with the problem of analyzing the meaning that people ascribe to the world" (Saljo, 1988, p. 36). Epistemologically, the world is
seen to be multi-faceted, and open to variations in interpretation. One common reality, available through "unbiased" observation of the world, does not exist. The world is always seen through filters—different conceptions of reality—if it is to be meaningful. Further, although these differences in conceptions may be indicators of variations in intellectual maturity, in complex societies they may simply indicate differences between, for example, common-sense and scientific conceptions of a phenomenon (Dahlgren, 1984; Saljo, 1988). In such societies, different explanatory frameworks—different conceptions of reality—are used for different purposes (Saljo, 1988).

Conceptions are the basis for reasoning and action (Marton, 1981). They refer to "actual experiences, understandings, and conceptualizations people have of various phenomena" (Beaty, Dall'Alba & Marton, 1990, p. 9). Ontologically, they have an experiential reality, and represent fundamental differences in kind. "Different conceptions more closely resemble the differences between ice and water than they do the differences between a litre of water and two litres of water, or salt water and fresh water" (Stalker, 1989, p. 42). Global conceptions differ from conceptions in that they are "simply abstract tools used to characterise the conceptions. They represent an attempt to formalize the researcher's understanding of the conceptions" (Beaty, Dall'Alba & Marton, 1990, p. 9). Thus different global conceptions may describe the same conceptions.
In summary, the idea of conceptions and the global conceptions which characterise them can be used as a convenient heuristic device to communicate the variety of ways in which people interpret and make sense of their worlds (Stalker, 1989). Phenomenographers consider the identification and classification of these aspects of thought structures constructivist inquiry, using qualitative data collection and analysis techniques. The following sections discuss these processes in detail.

Research Process

Recent Methodological Advances in Phenomenography

With phenomenography, as with other research methods, the focus of the researcher is a function of the specific problem being examined, and of the particular group of participants. Within this framework, phenomenographers until recently searched for "the essential, the most distinctive, the most crucial structural aspect of the relation between individual and phenomenon" (Marton, 1988b, p. 182). They characterized one way of understanding a phenomenon, in relation to other possible ways of understanding the same phenomenon. The researcher's judgement thus came into play in singling out a certain aspect, and other (possibly highly relevant) aspects, which may vary within the conceptions, were not mentioned when differences between the understandings were discussed (Marton, 1988b). Further, sometimes there was no variation among the
participants in some highly important aspects. In such cases, of course, these aspects were then not focused on by the researcher. Consequently, one of the drawbacks to the phenomenographic approach was that comparison between conceptions of the same phenomenon identified by different researchers, who focused on different aspects of the relation between the individual and the phenomenon, was difficult.

More recently, Beaty, Dall’Alba & Marton (1990) propose a methodological development, within the phenomenographic approach, which focuses on the nature of conceptions. In addition to 'the what' and 'the how' aspects of conceptions discussed earlier, Marton (1988b) has identified two further aspects of conceptions: a structural aspect and a referential aspect, which are dialectically intertwined with each other. Conceptions are considered to differ both structurally and referentially. Structurally, they differ with regard to "how the phenomenon and its component parts are delimited and related to each other," while referentially, they differ with regard to "the global meaning of the phenomenon" (Beaty, Dall’Alba & Marton, 1990, p. 2). The structural aspect has been further sub-divided into the external and internal horizons of the phenomenon. The external horizon is comprised of "the way in which the phenomenon is delimited from, and related to, its context," while the internal horizon is identified by "the way in which the component parts of the phenomenon are discerned and related to each other" (Beaty, Dall’Alba & Marton, 1990, p. 2). Additionally, as discussed
above, different components of the phenomenon may be the object of focus within the same conception; figure-ground variations can be identified (Renstrom, 1988, cited in Beaty, Dall’Alba & Marton, 1990, p. 2).

This differentiation of the various aspects of conceptions provided Beaty, Dall’Alba & Marton (1990) with more "versatile and elaborate conceptual tools than [had] previously been the case" (p. 2). With these tools, they were able to give more detailed and precise characterizations of the conceptions of the phenomenon which they were investigating—learning—than had been possible for other researchers. Specifically, they identified what differed among the conceptions against the background of what was common to the conceptions. However, they found that "to a large extent the features that best distinguish between the conceptions differ for different combinations of conceptions" (Beaty, Dall’Alba & Marton, 1990, p. 36).

Samuelowicz & Bain (1992), who investigate conceptions of teaching in post-secondary institutions, also discuss a methodological development in phenomenography, which is both similar to and different from that discussed by Beaty, Dall’Alba & Marton (1990). They begin by identifying global conceptions from the data, using the constant comparative method of analysis (Glaser & Strauss, 1967). Once they obtain the conceptions, however, they take the process a step further by comparing and contrasting the conceptions to extract the implicit dimensions "that can be used to delimit qualitatively
different conceptions of teaching" (Samuelowicz & Bain, 1992, p. 16). Finally, they used the dimensions to re-code the original transcripts. The same dimensions are used to define all conceptions. Thus, the internal consistency of the global conceptions is cross-validated by the dimensions. In their understanding, "there are relatively few dimensions by which qualitatively different conceptions of teaching can be defined, and . . . a conception is a unique combination of these dimensions" (p. 18).

Both the methodology proposed by Beaty, Dall’Alba & Marton (1990) and that of Samuelowicz & Bain (1992) help to delimit, with increased confidence, the boundaries of each conception. They also help to order the conceptions, given that any ordering process implies the use of judgement on the part of the researcher. Additionally, they provide frameworks which make it easier to locate individuals within conceptions.

Given that there are a limited number of qualitatively different conceptions of a phenomenon, as has been shown empirically, Samuelowicz & Bain’s (1992) notion of the existence of a relatively few dimensions which define these conceptions is logical. Further, if, as with conceptions, this can be shown empirically, the standard dimensions forming this coding system will provide a means of comparing conceptions proposed by various researchers. For these reasons, this research follows Samuelowicz & Bain’s (1992) expanded phenomenographic methodology.
Researcher's Role

In phenomenography, as in most qualitative research, the researcher is seen as an active participant in the inquiry process; consequently, understanding the effects of the researcher's involvement on both the process and the findings is important. Both the researcher's prior experience and background knowledge and her/his relationships with the participants are issues of concern.

A researcher's extensive background knowledge and prior experience "permits the recognition of complex situational variations" (Carpenter, 1991, p. 64), and the gleaning of relevant insights from experiences outside of or prior to the research itself. In phenomenography, the researcher's prior knowledge of the subject matter is a prerequisite for analyzing data, since conceptions are described in terms of their content (Saljo, 1988). Without an understanding of the content, the researcher can neither identify conceptions nor develop interrelated global conceptions as findings.

I have extensive experience teaching adults a variety of topics in workplace, recreational and academic settings. I have myself been a teaching assistant. Additionally, I have focused on teaching, beliefs about teaching, and how thoughts influence actions in teaching during my graduate course work and research. This background and knowledge provides me with the deep understanding of teaching needed for phenomenographic analysis, and has contributed to the development of insights throughout the research process.
In using prior knowledge and experience, the researcher must be cognizant of her/his own conceptions of the phenomenon being investigated, while not communicating them to the participants. Establishing conceptions held by others from interview data is difficult. Having participants, for whatever reasons, changing what would be their initial responses so their understandings appear to be compatible with those of the researcher could create significant problems.

I consciously tried not to reveal my conceptions of teaching to the participants. Several of them, after completion of their final interviews, asked me what I believed about teaching, or what my metaphor for teaching was. Their posing of these questions, at that point in the research process, serves as an indicator that they were unable to detect or respond to my biases during the actual interviews.

With respect to relationships with participants, it is recommended that the researcher, functioning as research instrument--"a highly sensitized and systematic agent" (Glaser & Strauss, 1967, p. 252)--avoid direct involvement or coming to feel totally 'at home.' Some sense of being a 'stranger' is necessary to maintain the essential critical and analytical perspective (Hammersley & Atkinson, 1983). At the same time, gaining access to respondents' views is based on having them accept the researcher as a reasonable and safe person with whom they can discuss their beliefs and values. Thus the development of a friendly, understanding relationship is essential. Language fluency and access to the participants are
both important factors in the development of a researcher-participant relationship. They are discussed further under Research Design.

With respect to my involvement with the participants, I interviewed each of them three times, and observed each of them teaching once. In addition, I was a participant observer/program evaluator at both of the teaching training programs which various respondents attended. At one of these programs, due to unforeseen circumstances, I functioned, on short notice, as an instructor facilitating mini-lessons. At no time did I lose my sense of being in some way a 'stranger' to the participants, whether it was as a researcher interviewing them, an observer evaluating the training program they were attending, or an instructor teaching them. It is possible that some of them may have initially perceived me as an authority figure, either because I was from Adult Education, or because for some of them, I was an instructor. However, I believe that my dual involvement with them, during the interviews and at the teaching training programs, contributed to the development of a feeling of empathy and trust between us. They had a chance to meet me at the first interview. The teaching training programs, coming as they did after the first interviews but prior to those remaining, further helped us develop a trusting relationship. They saw me and got to know me as a participant observer in the training programs, in some cases working with them, in other cases learning as they were; I saw them practising their teaching of topics that were
clearly vitally interesting to them. Together, we realized that we were people interested in the same thing, teaching, who could learn from each other in a safe and trusting environment.

The presence of the researcher in the research situation has also been discussed using the terms 'insider' and 'outsider' (Hammersley & Atkinson, 1983). An outsider brings no more than academic understanding of a situation to a research setting. In contrast, an 'insider' is a member of the group or society being inquired into, and has the advantage of understanding—in the sense of sharing the meaning of—the participants' perspective (Carpenter, 1991).

My perspective as a researcher falls somewhere between that of "insider" and "outsider." My knowledge and understanding of how I learned to teach, of teaching itself and of the "world" of a teaching assistant, gained through experience and study, allow the adoption of a relatively "insider's" view. However, my prior teaching experience and knowledge makes my background and experience as a TA quite different from that of the participants—for example, I was not attending the teaching training program as a learner, since I initially learned what they were learning about teaching over ten years ago. In this sense, I began my research as an 'outsider.'

In summary, the role of the researcher in qualitative research, including phenomenography, is crucial. In such inductive and generative studies, where the goal is to discover constructs, the subjectivity of the researcher influences the
conduct and analysis of the research (Goetz & LeCompte, 1984). Prior knowledge and experience, and relationships with participants, are two important factors affecting the "credibility, comprehensiveness, and comparability of the research results" (Goetz & LeCompte, 1984, p. 239). Identification of such factors, and analysis of their impact on the research, are important aspects of any qualitative research.

I have extensive experience teaching adults numerous topics in a variety of settings, including experience as a teaching assistant. My graduate course work has focused on beliefs about teaching and the influence of thoughts on actions. Evidence that I was successful in not revealing my conceptions of teaching to the participants exists in that they asked me what my conceptions were at the end of the series of interviews. My ongoing association with the participants throughout the research was such that we developed a friendly, understanding relationship. Because of my knowledge and experience, my perspective as a researcher fell somewhere between that of an 'insider' and that of an 'outsider.'

Rigour, Trustworthiness and Authenticity

All research endeavours, regardless of the approach taken, are evaluated on their merit. Such evaluations are based on the extent to which established criteria, used to judge the worth of the research, are met. The criteria used by positivistic inquirers who conduct quantitative research
establish a standard of rigour, and include internal and external reliability, and internal and external validity. These criteria emerged from the ontological, epistemological and methodological foundations of positivism; the differences in the belief systems underlying positivism and constructivism mean that the applicability of such criteria to constructivist inquiry is dubious at best (Guba & Lincoln, 1986; Krefting, 1991).

Constructivists have taken two approaches to the development of criteria applicable to constructivist qualitative research, and have developed two different sets of criteria (Guba & Lincoln, 1986; Lincoln, 1990). The first set of criteria has been called criteria of trustworthiness. These criteria are parallel to the positivists' criteria of rigour, but have been reinterpreted to reflect the underlying belief system of constructivism. In a classic work, Lincoln and Guba (1985) reconceptualized internal validity as credibility, external validity as transferability, external reliability as dependability, and internal reliability or objectivity as confirmability.

The second approach has led to the development of criteria generated from the belief system of constructivism itself, with no reference to other paradigmatic systems. The criteria developed in this way have been termed authenticity criteria (Guba & Lincoln, 1986; Lincoln, 1990). These criteria include fairness, ontological authenticity, educative authenticity, catalytic authenticity, and tactical
authenticity. While the criteria used in the two approaches are discussed in detail below, the discussion of activities used to ensure that credible findings and interpretations are produced is limited to those applicable to this research.

Criteria of Trustworthiness

Credibility.

Credibility is the extent to which the descriptive categories derived from the data coincide with the experiences of the respondents. It is "the plausible credible representation of multiple realities" (Stalker, 1989, p. 20); the "degree to which the . . . conceptual categories have mutual meanings between the participants and the researcher" (McMillan & Schumacher, 1989, p. 192). Krefting (1991) has suggested that qualitative research is credible "when it presents such accurate descriptions or interpretation of human experience that people who also share that experience would immediately recognize the descriptions" (p. 216). A researcher achieves credibility by conducting the activities of the inquiry to ensure that there is a high probability that credible findings and interpretations will be produced. The activities noted below were used in this study.

First, the collection of data over a prolonged period permits researchers to learn the context, minimize distortions introduced as a result of bias and/or misunderstanding on the part of the researcher and/or the respondents, and build trust with the participants. This extended time period is important
because as rapport increases between the researcher and the participants, they may volunteer different and/or more sensitive information than they would have at the beginning of a research project, or during the course of a shorter relationship.

Second, credibility can be enhanced within the interviewing process. It is important to remember that an interview is a social setting (Fleming, 1986), within which 'reality,' construed as a cognitive phenomenon within people, is also a social phenomenon created by the interaction occurring between the participating individuals. A researcher must be on the lookout for participants who "respond with what they think is the preferred social response" (Krefting, 1991, p. 218), or with responses "created in the interview itself" (Fleming, 1986, p. 550), rather than with what they truly believe. Among the many possible sources of such created responses are

- the power differential between researcher and respondent,
- the cuing effect of the researcher's demeanour and body language,
- the respondent's suppositions of what the research might really be about,
- the degree of rapport between the two parties,
- forgetting (deliberate or otherwise),
- partial recollection of events and the subsequent interpolation of plausible information to fit the gaps,
- and the precise method of eliciting the account.

The list is by no means exhaustive: the problem for the researcher is to discern the signal amongst all the noise. (Yorke, 1987, pp. 44-45).

In attempting to 'discern the signal,' numerous interviews assist the researcher in identifying such situations, and reframing of the questions or the use of hypothetical situations often helps to elicit more personal responses.
Repetition of questions and expansion of questions during different interviews also enhances credibility.

At the same time, it is important to remember that interviews about beliefs and values may be asking participants to articulate understandings which have been implicit up to this point. It is thus quite likely that partial, incomplete and contradictory conceptions may be used by interviewees in the course of such an interview, as they try to think through their previously implicit understandings, while being a 'good interviewee.' Qualitative research seeks a range of experience or phenomena; "the data are not necessarily consistent but are in fact credible if described and interpreted correctly" (Krefting, 1991, p. 220).

Fleming (1986) considers that accounts given in one setting—that of the interview—cannot "be treated as literal descriptions of actions, beliefs, conceptions, perceptions and understandings in situations beyond the interview" (p. 553)—for example, in the teaching context. Phenomenographers answer this concern by "accept[ing] human thinking as contextually determined" (Saljo, 1988, p. 42). Regardless of the method used for generating data, all human thought occurs in a communicative setting, and is determined partly by the particular circumstances of expectations and situation. Some phenomenographic assumptions are important in further dealing with this issue. People have a tendency to use given conceptions of reality in various settings or in relation to specific problems, but they will not necessarily always adopt
that particular conception (Dahlgren, 1984; Saljo, 1988). Individuals do not have conceptions of reality residing within them; rather, they choose which ones to use in a given situation. Conceptions are conceived as relational phenomena, developed as a result of the interaction between the individual and the object/phenomenon, rather than as inherent qualities of the thinker or the object. As with all linguistic expressions, they are abstractions from reality which are made in different ways in different contexts (Saljo, 1988). Despite the difficulties with using interviews,

> to study teacher thinking, researchers must depend on teachers to think aloud, either while in the act of thinking and deciding, or retrospectively; one cannot observe thought directly. (Clark, 1988, p. 8)

Third, an external check on the credibility of the research involves peer examination in which the researcher discusses the research process and findings with colleagues experienced in qualitative methods who are not involved with the research. Such discussions ensure that researchers explore the beliefs and assumptions underlying their interpretations.

Finally, when the possibility exists of directly testing the findings and interpretations against the raw data, credibility is enhanced. Ensuring that the data are fully recorded, transcribed and available in archived form, and that the research process and reporting of findings are done so that the research can be examined publicly, serves to accomplish this.
Transferability.

Transferability is the degree to which research conclusions can be applied to other groups. Generalizability to other settings is not the intent of phenomenography. Rather, the purpose of phenomenography is to provide a description of the variation in individuals' experiences of some phenomenon to extend our understandings. The global conceptions and their dimensions can be used in other research as a sort of "map of the territory" (Saljo, 1988, p. 44), to discover the sources of variation in conceptions, and to compare various groups of persons as to the situations in which they hold certain conceptions. To make such comparisons, constructivist researchers need to know not only the context and time from which the global conceptions originate (sending or earlier context), but the context and time against which they are to be compared (receiving or later context) (Lincoln & Guba, 1985). This transferability of findings is best accomplished by providing the thick description necessary "to enable others interested in making a transfer to judge whether or not that transfer is possible" (Stalker, 1989, p. 21). Equally important to extending the meaning of the findings is the "degree to which [the phenomenon] may be compared or contrasted along relevant dimensions with other phenomena" (McMillan & Schumacher, 1989, p. 194), or the extent of typicality of the phenomenon. This is also enhanced by "the degree to which the researcher used theoretical frameworks and research strategies that are understood by other researchers in
the same or related disciplines" (McMillan & Schumacher, 1989, p. 194).

**Dependability.**

Dependability is the extent to which other researchers would consistently find similar results in the same or similar settings. It is enhanced by detailed descriptions of the context, the participants, the role of the researcher, the conceptual framework, the research methodology, and the reasoning behind methodological decisions. Dependability is enhanced by many of the same techniques which enhance credibility.

**Confirmability.**

Confirmability is concerned with the extent to which others would match conceptual categories to data in the same way that the researcher did--inter-judge reliability (LeCompte & Goetz, 1982). Because the global conceptions are constructed by the researcher, it is not assumed that another person, reading the data, would discover the same conceptions (Marton, 1988b). Rather, the global conceptions should be defined with sufficient clarity that another person would place the data within the same classifications. Marton (1988b) likened it to two botanists independently discovering the same plants on the same island. While they would not be expected to classify the plants in the same way, it would be expected that the explanation given by each one as to how they classified the plants would make sense to the other one.
Confirmability is enhanced in phenomenography by the writing of judgement instructions to be used by a co-judge (Saljo, 1988). These instructions identify the general differences between the global conceptions, providing examples of statements to be considered instances of Conception 1 or Conception 2. The co-judge then classifies the conceptions following the judgment instructions. Co-judging in this way is a check of the communicability of global conceptions. It can be understood as a process of testing if it is possible to communicate the findings to another person in a sufficiently explicit way that this person would classify the statements made by interviewees in the same way as the researcher has done. (Saljo, 1988, p. 45)

Confirmability is also enhanced by the use of the respondents' own words (quotes) in the construction of the descriptive groupings, as well as by many of the techniques which enhance credibility and dependability.

Criteria of Authenticity

These criteria include fairness, which can be defined as the need for research to address multiple realities fairly. They also include four 'states of being' criteria, which relate to (a) levels of understanding and sophistication and to (b) the enhanced ability of participants and stakeholders to take action during and after an inquiry and to negotiate on behalf of themselves and their own interests in the political arena (Lincoln, 1990, p. 72).

Fairness.

Fairness is concerned with recognizing and ensuring that inquiries express multiple, socially constructed, and often
conflicting realities (Lincoln, 1990). Methodologically, it is concerned with the steps that the researcher takes "to give a fair and impartial hearing--and an equal chance at inclusion--to each of the several constructions that might be formulated in a given situation" (Guba & Lincoln, 1986, p. 150). The goal of phenomenography is to map the qualitatively different ways in which people experience and conceptualize various aspects of, and various phenomena in, the world around them (Marton, 1988b). Thus it is concerned specifically with identifying and describing the different constructions of a given phenomenon in a particular situation. These different constructions may be held by different people, or one individual may hold multiple and/or contradictory constructions. Regardless, the goal is to identify and clearly describe all.

**Ontological authenticity.**

Ontological authenticity is concerned with the extent to which those involved with the research have gained an increased awareness of their own assumptions and constructions, both explicit and implicit. The techniques which enhance credibility enhance ontological authenticity. Further, teachers who have participated in research inquiring into their thought structures and/or thought processes report that

*bringing their sedimented theories of instruction to their own attention provides an opportunity for analysis and revision that is self-initiated rather than researcher-driven... develop[ing] tools that teachers can use whether or not they are directly involved in research. (Clark & Lampert, 1986, p. 30)*
This process occurred in this research with four of the participants, who discussed it with me explicitly, and may have occurred with others.

**Educative authenticity.**

Educative authenticity extends ontological authenticity. It is concerned with the degree of heightened awareness and appreciation—-not necessarily acceptance—of the constructions of others among those participating in the research process. The techniques which enhance all of the criteria of trustworthiness also enhance this criterion.

**Catalytic authenticity.**

Catalytic authenticity is "judged by the prompt to action generated by inquiry efforts" (Lincoln, 1990, p. 72), among all research participants. Such action could include application of the findings to practice, the generation of ideas leading to further research, some combination thereof, or something else entirely. Simply participating in the research as a respondent may constitute one such prompt to action. Techniques enhancing credibility and transferability may also act as such prompts, as may clear, well thought out recommendations in the research report.

**Tactical authenticity.**

Tactical authenticity extends catalytic authenticity. It is concerned with the ability to take action, engaging the political arena on behalf of either one's referent participant or stakeholder group, or oneself. This criterion is
particularly relevant to evaluation research, although it may also be applicable in other research situations.

**Summary**

Phenomenographic research addresses issues of rigour, trustworthiness and authenticity from an ontological, epistemological and methodological basis of constructivism, stressing the importance of the research context. The goal of the research is the characterization of global conceptions that emerge from the data. In this, as in other qualitative research, the researcher is an active data collection instrument, and the focus is on understanding the way participants make meaning in their lives. Thick, rich description is essential. The research process is both systematic and flexible, allowing for changes in the research question or increased clarity in identification of the issues as a result of new insights and information acquired during the process.

**Research Design**

Data collection and analysis procedures are not discrete activities, rather they arise out of the chosen research perspective. The adequacy of the results can not be separated from the processes which generate these results (Glaser & Strauss, 1967). The objective of phenomenographic research is to be true to the assumption of the contextual nature of human
experience. Thus the research methodology will necessarily be adjusted to the situation and the problem being studied (Saljo, 1988).

**Context: Setting and Participants**

The setting for this research is the University of British Columbia (U.B.C.), in particular the Teaching Assistant Training Programs conducted by the University Faculty Development Project in 1991-1992. Potential participants in the research consisted of the 43 teaching assistants registered for the two Teaching Assistant Training Programs conducted that year.

This setting satisfied several criteria specific to this research. First, to be accepted for registration in these programs, the teaching assistants had to be either teaching during the current term, or to have taught in the previous term. Simply marking for a professor, rather than teaching, was not acceptable. Thus all potential participants had recent teaching experience.

Second, these particular training programs were designed for teaching assistants fluent in the English language. Thus, all potential participants could be expected to have a good working knowledge of English, whether or not it was their first language. Fluency in English was considered essential to this research, since my first language is English, and I was to conduct all the interviews, many of which would involve discussions of personal philosophy and beliefs. Such
discussions are difficult enough in a language with which both participants are comfortable, let alone when dealing with problems of understanding and fluency.

Third, the training programs were advertised throughout the university; all of the approximately 1,600 graduate teaching assistants at U.B.C. were eligible to apply for them. Of that number, about 100 did apply. Forty-three were subsequently accepted and attended. Thus, the 43 potential participants were among those teaching assistants at U.B.C. who believed that teaching was important, and who were prepared to put some personal time and effort into thinking about and working to improve their teaching.

Initial access to the potential participants was obtained by contacting the Director of Faculty Development. After a thorough discussion, she gave her approval for me to recruit participants from the teaching assistants registered for the Training Programs.

Two concerns exist when it comes to gaining access to participants. There is the practical issue of finding participants who will agree to be interviewed several times. There is also the problem of "accessing the views of the world" (Stalker, 1989, p. 46) held by the participants.

In the first instance, after approving the research, the Director of Faculty Development ensured that copies of my contact letter (Appendix A) were included with her department’s mailings to all teaching assistants accepted for the Training Programs. These contact letters were followed up by a phone
call, either from a potential participant to me, or vice versa, during which the research and the interview process were more fully explained. All potential participants were assured that they were in no way required to participate, that their participation was intended to be voluntary, that anything they said would be confidential, and that their registration for the Training Program did not depend on their participation in this project. The eleven individuals who subsequently agreed to participate in the research signed a consent form (Appendix B), and mutually convenient times for interviews were arranged.

In the second instance, participants who accept the researcher as a reasonable and trustworthy person with whom they can discuss their beliefs and values allow the researcher to access their views of the world (Stalker, 1989). To facilitate this process, I discussed the research in detail with participants both by phone and at the time of the initial interviews. I encouraged them to ask me any and all questions they had about the project, and discussed my own background and interest in the area with them.

At the same time, it is important to maintain a balance between being an "insider" and an "outsider." In this research, the participants' openness about problems and aspirations to do with their teaching and research, their supervisors, students and departmental politics are evidence of the existence of a trusting relationship between us. Distance from the research setting was maintained by taking "time out"
away from the data collection process between the three sets of interviews.

The volunteer participants met three criteria, as discussed above: they were currently, or had very recently been, teaching; they spoke fluent English; and they were interested in thinking about and improving their teaching. Eleven of the forty-three teaching assistants registered in the training programs initially volunteered to participate. One was forced to drop out due to circumstances beyond her control, which required her at short notice to pick up an additional graduate course more than a third of the way into the term. She simply did not have the time to continue her participation. A second participant dropped out for unknown reasons before the final interview. Despite extensive efforts, I was never able to contact him to complete the interview series, or to determine why he did not wish to continue participating.

A demographic questionnaire (Appendix C) was used to collect detailed information on each participant (see Appendix E) at the beginning of the interview process. Briefly, the initial group of participants consisted of five men and six women. One woman and one man dropped out before the end of the research process. Two were teaching assistants in the same department; each of the others taught in a different department or faculty. One, although not a teaching assistant at the time of the research, was to teach a course at another university this summer. Their ages ranged from the 17-24 category to the 35-44 category, with representation in each category as follows
(17-24: 2; 25-34: 4; 35-44: 5). Their experience as teaching assistants ranged from one month to six years. One conducted social science seminar/discussion sessions once a week, five conducted humanities seminar/discussion sessions once a week (one of these dropped out), two conducted science labs, one taught an entire course in science, and one taught an entire course in humanities (she dropped out after the first interview). One was not teaching at the time of the research.

In choosing an appropriate number of participants for the research, I had to give consideration to the time and resources available to me. The respondents needed to be willing to spend 4 1/2 to 6 hours in interviews with me, to share considerable personal information about their beliefs and values, and to allow me to observe them while they taught. Eleven participants from the teaching training programs volunteered to assist with the research. This number was deemed sufficient to ensure credibility, given that the total population consisted of forty-three persons. That number of respondents is congruent with similar qualitative and phenomenographic research conducted by a single researcher for a master’s thesis in Adult Education at U.B.C. (Carpenter, 1991; Goldie, 1992).

It is important to note, again, that there was no intention to consider these participants as representative of the general population. Rather, the results of the research increase our understanding of teaching assistants’ conceptions
of teaching, and highlight areas worthy of more in-depth investigation.

**Data Collection**

Data for this study were collected in three ways. First, a survey-type questionnaire collected demographic, professional, and personal information about the participants. Second, each participant was observed once, teaching in her/his own context. The purpose of this observation was to gain some idea of the context in which the individuals taught, and how they taught, and to provide some base information to be used as a starting point for the initial interviews. Finally, interviews--the primary method of phenomenographic data collection (Marton, 1988b)--were used to uncover teaching assistants' conceptions of teaching. Interviews are considered particularly effective in researching the complex, interwoven and elusive meanings that people attach to a phenomenon (Stalker, 1989).

Each participant was interviewed three times: before attending the teaching training program, immediately after attending the program, and four to eight weeks later. The original intention was that the participants would have an opportunity to return to their own teaching context, and possibly put into practice what they had learned at the training program, before the third interview. Unfortunately, the TAs' union is the same as that of the University support and maintenance staff, who were on strike during this period.
The TA union local supported the strike and very few of the participants in this research were able to teach during this period. Consequently, their implementation of what they had learned, and reflection on that implementation prior to the third interview, was limited.

The interviews were semi-structured, using the same open-ended questions for all participants while allowing flexibility in both the ordering of the questions and the ensuing dialogue, to achieve a natural and responsive interview. This dialogue was determined partly by the dimensions of the questions which the participants chose to answer, and partly by the additional probing questions I developed in response to the answers given. Open ended questions have several advantages for this type of research (Stalker, 1989). They are interactive, flexible and adaptable to individual situations. They permit probing into ambiguous answers, and into the context and reasoning behind answers. Thus they give insight into the participants' understandings of teaching as a phenomenon in their worlds, from their perspectives.

Several steps were taken to test the interview guide. First, pilot interviews with two individuals who taught in the higher education context, but who were not teaching assistants, were conducted. These interviews were used to ensure that the questions asked related to the research, that the sequence of questions was appropriate and that the questions were clear, unambiguous and not leading. Following some revision, the questions used in the pilot interviews became the interview
guide for the first interview, and for parts of the second and third interviews.

Second, the revised interview guide was critiqued by an expert interviewer, interested in the research. Additional revisions to the interview guides for all three interviews were made following this critique.

Finally, the results of a continuing literature review and some preliminary analysis of the initial data led me to revise the interview guide for the third interview. This final revision resulted in an interview guide which, while retaining many of the questions initially tested and accepted, also incorporated some additional open-ended questions. The final interview schedules both probed effectively and flowed naturally (see Appendix D).

The structured questionnaire schedule was critiqued by three expert interviewers. Some subsequent revisions were made to this questionnaire on the basis of the critiques received.

Because of the personal and often abstract nature of many of the questions designed to elicit beliefs about teaching, each of the three interviews began with questions about concrete aspects of their teaching or of the teaching training program. Additional questions focused on their views about the management of teaching, and reflections on their teaching careers to date. Final questions were specifically concerned with their abstract understandings and representations of teaching. Throughout the interviews, probing questions clarified and elaborated participants' answers. The 'formal'
interview was then declared completed, and additional comments about any of the areas discussed were encouraged and recorded.

Data from the majority of the interviews were collected by cassette recorder and archived, and are thus available for public credibility checks in the future. Electronic equipment problems resulted in data from two interviews being available in note form only. These notes have also been archived and are available for public checks. Individual 45 - 120 minute interviews were conducted over an eleven week period. The majority of the interviews were held either in participants’ offices or in a quiet location at the Adult Education Research Centre at U.B.C.. At the participants’ requests, in one case, an interview was held by telephone; in two cases, they were held in the participants’ homes.

At the conclusion of the first recorded interview, a short structured questionnaire with both open and closed end questions collected a second kind of information on the participants. Details of that questionnaire are displayed in Appendix C. Briefly, it collected data on gender, age, educational attainment, duties as a teaching assistant, previous teaching training, and previous teaching experience.

**Data Analysis**

Each interview was transcribed verbatim as soon as possible after it was completed (with the exception of those where equipment problems were experienced), because analysis was conducted in conjunction with the data collection process.
Each transcript was read and re-read, with comments relevant to the belief aspects of thought structures about teaching marked and analyzed for meaning within the context of the whole transcript of each particular interview. Questions I asked myself during this process included: How does the participant construe teaching? What concepts does s/he use to explain it? What types of similarities with other phenomena are introduced? What are the metaphors for teaching used? How does the participant describe her/himself as teacher? How does the participant construe learning? What are the roles of a teacher believed to be? What are the roles of the students conceived to be? How important is subject matter understood to be? During this process, care was taken to make sure that the context of the words was retained.

Selected statements related to beliefs about teaching were then separated from individual interviews and clustered into a "pool of meanings" (Marton, 1986, p. 43). Attention thus shifted from the individual interview which provided the context for the quote to the meanings embedded in the quotes, whether or not these meanings originated from different individuals (Marton, 1988b). This process involved the noting of the sentences, phrases, or words on individual sheets of adhesive backed paper. The sheets containing the quotes were then physically placed into groups on a wall, and sorted several times into possible groupings of conceptions. This method had the advantage of arranging the data in readily available groupings, which could be placed side by side and
compared. The quotes were sorted into groups on the basis of similarity, and the groups delimited from each other in terms of differences (Marton & Saljo, 1984). During this process, when a contradiction emerged, I returned to the transcribed interviews to help identify, clarify or reaffirm my understanding of the contradictory quote. Each group of quotes was then analyzed for its core meanings, and criteria for each global conception established, based on the similarities and differences among the beliefs identified. After re-reading the transcripts, the global conceptions were refined and eventually stabilized.

Both the global conceptions and the conceptions are in this way grounded in the data. While they are my constructions, they are also abstractions from the language used by the participants in describing their experiences and understandings.

Once the global conceptions were established, the next phase of the analysis began. At this stage, many previous researchers have proceeded by looking for the referential and structural aspects of the conceptions. I chose instead to extract constituent dimensions from the global conceptions; I saw this procedure as providing more practical and useful results both for this research and for subsequent comparisons of my findings with the findings of others.

During this phase, the global conceptions were compared and contrasted "so that the implicit dimensions comprising them could be extracted" (Samuelowicz & Bain, 1992, p. 7, emphasis
in original). A number of constituent dimensions—in terms of which the similarities and differences among the conceptions can be described—were identified. Thus each global conception is considered to be "a unique profile within these . . . dimensions" (Samelowicz & Bain, 1992, p. 13, emphasis in original). This aspect of the analysis process resulted in a formalized coding system, which was then used to re-code the original transcripts in order to check the consistency of the conceptions, and to assign conceptions to individuals.

The stability and unique nature of each global conception was established by the use of an independent judge, who was a graduate student both serious about and committed to the task. The general nature of each global conception was described to the independent judge, following the descriptions which occur in this thesis. The judge was then given quotes which were used to group the conceptions, and was asked to place each quote on pieces of paper labelled with the names of the different global conceptions. A minimum of 95% agreement between the judge’s and my placement of quotes within the global conceptions was attained (Appendix F).

**Informed Exploration: The Research Process**

This research explored the initial conceptions of teaching, implicit or explicit, held by nine teaching assistants, and identified changes in those conceptions during the research period. The research was a constructivist inquiry, using the qualitative approach of phenomenography,
which yields global conceptions as research findings. This approach was modified following a recent methodological advance, to incorporate the extraction of constituent dimensions from the conceptions. A unique profile of common dimensions thus defined each global conception.

As with other qualitative research, the literature review (the "informing phase") and the data collection and analysis (the "exploration phase") were not discrete activities. The hermeneutical relationships between the informing and the exploring aspects of the research process are depicted in Figure 2 below.
Note: Although this diagram shows the process as somewhat linear, it was also hermeneutical and dialectical, in keeping with the concept of informed exploration. Ideas and information from the informing process influenced the exploring process and vice versa throughout the research.

Limitations of the Research

Phenomenographical research is limited in several ways. First, in most such research, as in this case, interviews are
used to discover what people think. The danger with interviews is that people will tell the interviewer what they think s/he wants to know, as opposed to what they really believe; that they will "perform," acting the part of the "good person."
While this possibility decreases with the development of good rapport between researcher and participants, and with participation in more than one interview, it remains a limitation.

Second, findings from phenomenographical research describe the qualitatively different ways in which people understand an aspect of their world, in this case teaching. In doing so, they specify the sources of variation among the global conceptions describing the conceptions which people hold. However, as findings from constructivist inquiry, what they do not do is attempt to explain the reasons for the variation, and this may be considered by some a limitation of the research. At the same time, once the global conceptions and their sources of variation have been discovered, other researchers can then use other methodologies in attempts to explain the sources of variation among the global conceptions.

Finally, because different phenomenographical researchers characterize and define the conceptions they discover in different ways, it is difficult to compare findings from research investigating conceptions of the same phenomenon. This study presented one means by which the possibilities for comparison can be increased, with its definition of conceptions as unique profiles of constituent dimensions. However, this
modification to the methodology is not yet in wide use, and this difficulty of comparison remains a limitation.

Other limitations to the research include the use of volunteers, since they are known to have characteristics that differ from those of non-volunteers. In general, volunteers tend to be "better educated, of higher social class, more intelligent, more sociable, more unconventional, less authoritarian, less conforming, more altruistic, and more extroverted than non-volunteers" (McMillan & Schumacher, 1989, p. 161). However, this is of more concern when the characteristics which differ are the focus of the research and/or when the objective of the research is to be able to generalize the results to the population. In addition, for ethical reasons, participants in research such as this are required to give informed consent; therefore they must be volunteers. I made a considerable effort to inform all potential participants that there were no rewards or sanctions attached to participation, and that there were no right or wrong answers to questions. These points were included in the contact letter, and subsequently discussed in detail with each potential volunteer to minimize bias among those who were interviewed. Despite this, it is important to acknowledge that some distortion of the findings may have occurred as a result of using volunteers.

The small number of participants limit the results—the global conceptions. However, it is necessary to keep the numbers small in such research because of the time-consuming
and labour intensive nature of data collection and analysis (Marton, 1988). Further, a limited number of teaching assistants attended the pilot teaching training programs conducted by Faculty Development.

My pre-conceived conceptions of the phenomenon also limit the research, influencing as they did the design of interview questions, the conduct of the interviews and the derivation of the global conceptions and their dimensions from the data. Such pre-conceptions occur in all research. To the extent that they can be, these issues have been mitigated by my identification of my biases in this research report, and by submitting the data analysis to an independent judge.

Summary

This chapter discussed constructivist inquiry, the paradigmatic background of this research, and examined the specific approach of phenomenography and the recent methodological developments within phenomenography which guided the data collection and analysis processes. The role of the researcher and issues of rigour, trustworthiness and authenticity in phenomenographic research were reviewed. The context of the research, including the setting and the participants was outlined. Four male and five female teaching assistants from various departments and faculties at U.B.C. who participated in a teaching training program were interviewed. Three 45 - 120 minute interviews with each participant, an
observation of their teaching, and a survey type questionnaire were used to collect data. Although data analysis followed standard phenomenographical procedures, it expanded on them through the use of dimensions extracted from the data, which were used to cross-validate the internal consistency of the global conceptions. The chapter concluded with a discussion of the limitations of the research.
Another way to change the face of your teaching is to look at it from a different perspective. This is another technique of creative thinking: view an objective from a different perspective in order to discover aspects of it that are hidden from view.

Marilla D. Svinicki
Changing the Face of Your Teaching

This chapter begins presenting and discussing findings from twenty-seven interviews—three interviews with each of nine teaching assistants—conducted over a four month period. The interviews were conducted before, immediately after, and from six to eight weeks after each of the teaching assistants had participated in a teaching training program.

This research explores the conceptions of teaching held by the nine graduate teaching assistants. It also looks at the ways in which their conceptions change over time. Values and beliefs, the belief aspects of our thought structures, influence both our thought processes and our actions in our teaching practice. The goal of this research is to expand our knowledge of the values and beliefs underlying the conceptions of teaching held by teaching assistants.

The findings in this chapter are presented and discussed in two major sections: (1) Portrait of respondents and their context; and (2) Global conceptions of teaching.
Portrait of Respondents and Their Context

As discussed in Chapter Three, the experiences which individuals have with the world around them create individual-world relationships. These relationships form the contexts within which individuals develop the reasonings around their activities (Marton, 1981). The context thus plays an important role in the understandings of phenomena formed by individuals.

In examining the conceptions of teaching held by this group of teaching assistants, understanding their contexts is particularly important. The literature indicates that: (1) conceptions of teaching may vary by context; and (2) individuals may hold both ideal and working conceptions of teaching, influenced by the contexts within which they teach. Further, since my approach to this research is constructivist, a detailed description of the context is an essential element of the research. It enables other researchers to determine the transferability of these findings to similar contexts. The dependability of this research—the extent to which other researchers would consistently find similar results in the same or similar settings—is also enhanced by detailed descriptions of the contexts and the participants.

This portrait of respondents and their contexts begins with a brief comparative review of the general context within which most TAs teach, as discussed in detail in Chapter Two. This is followed by a detailed description of the teaching assistants who participated in this research, and of the
specific settings within which they teach. Information in this section is derived from the demographic questionnaire (Appendix D) and from my observations of the nine TAs in their teaching contexts. A review of the teaching assistants' perceptions of aspects of their contexts, based on data collected during the interview process and illustrated by quotations from those interviews, is then presented. The portrait concludes with a brief discussion of the similarities between this group of TAs and those previously discussed in the literature.

**TAs' Teaching Context: Summary From The Literature**

Research has shown that teaching assistants teach within a context which is complex and in many ways unique (McGill, Shaeffer & Menges, 1984; Nyquist, Abbott & Wulff, 1989; Staton & Darling, 1989). Juggling conflicting priorities and roles as graduate students and teachers, teaching assistants perform a constant balancing act. While they are often outstanding students, most have little if any teaching training and/or support. Consequently, many teach by emulating memorable teachers and by applying skills they have learned in settings related to, but not identical with, teaching. The extent to which they are successful varies. The stresses created by the demands of this dual role are many, and they are not lessened because the role is a transitional one.
Description Of Respondents

There are approximately 1,600 teaching assistants at the University of British Columbia. About 100 applied to participate in the teaching training programs conducted by the Faculty Development Program in 1991-1992. Of the approximately 100 applicants, forty-three attended these programs and were thus potential participants in this research.

From those forty-three, eleven teaching assistants from nine academic departments/faculties initially volunteered to participate (see Appendix C). Nine individuals, five women and four men, maintained their participation to the conclusion of the research process. They ranged in age from early twenties to mid-forties, as many graduate students now do. The majority (six of the nine) were in their first year as teaching assistants. Of the remainder, two were in their second year, and one in his sixth. Six had no prior teaching experience, seven no prior teaching training. The previous training received by two TAs consisted of attendance at two two-hour sessions conducted by the Teaching Assistants' Union.

Their duties ranged from teaching a set curriculum for classes three times per week, to developing the curriculum for and conducting tutorial/discussion groups once per week. Some taught science labs which met once per week. Two were responsible for setting assignments; seven for marking and grading. Six of the nine regularly met with students outside of their teaching sessions.
The numbers of students in their classes ranged from five in one science lab to 40 in both a science class and a social sciences discussion group. Among those TAs who taught a session once per week, the mean number of students was 26. There were 40 students in the class taught three times per week.

Three TAs taught first year students and three taught second year students. The others taught a combination of third and fourth year learners.

Teaching assistants were paid for a variety of hours which ranged from a full teaching assistantship of twelve hours per week, through half and quarter TAships, down to a one eighth TAship of 1 1/2 hours per week. There appeared to be little consistency among departments as to how the duties of TAs, the hours they were required to work, and thus the amount they would be paid, were determined. This seemed to be so despite the fact that TAs belong to a union.

**Teaching Settings**

One of the TAs taught in a regular classroom in an old building, with "lecture chairs" (with wide arms for writing) fixed to the floor. Windows, which could be opened, ran along one wall. The room had five blackboards, which were used extensively by the TA in his lectures. The "bell" rang at the half hour, to signal the beginning of class, and fifty minutes later, to signal the end of class. Between five and ten of the forty students, many of whom had to come from other classes
across campus, were often late. Everyone began packing up when the "end of class" bell rang, whether the TA had finished speaking or not, although they did not leave until he had finished. The primary teaching and learning activity conducted in this setting was the lecture.

One TA taught a science tutorial in a lecture theatre, with fixed seats, in an equally old building. This room had blackboards and an overhead projector, both of which the TA used on occasion. There were no windows. After the opening presentation by the TA about the assignment, learners worked on their own in their seats, with the teaching assistant moving from person to person to provide individual help as necessary.

One TA taught a social sciences discussion group in a seminar room furnished with tables pushed together to form a "conference table." A blackboard and overhead projector were available and used occasionally by the teaching assistant. One wall consisted of windows which could be opened. Teaching and learning activities included short lectures, small and large group discussions, debates, and individual and group presentations.

Two teaching assistants taught humanities discussion groups in classes equipped with movable lecture chairs. While blackboards and overhead projectors were available, they were used infrequently by the TAs. Both rooms had windows which could be opened. Teaching and learning activities included small and large group discussions and student presentations.
One TA taught a science lab in a regular laboratory setting. Students sat on stools at high built-in "cupboard-tables." The lab had a blackboard and an overhead projector, both of which the TA used frequently. Teaching and learning activities included demonstrations by the TA and experiments conducted by the students.

Two TAs taught humanities discussion groups, one in the foyer of a substantial building and the other in a large room in an old Army hut. Neither location had adequate seating, tables, blackboards or overhead projectors. Teaching and learning activities included small and large group discussions, role plays, and simulations.

These settings vary according to the facilities available to individual departments and faculties at U.B.C., and can be considered typical. As an older university which has had limitations on capital funding for many years, U.B.C.'s physical plant is composed of an eclectic mix of structures.

**TA's Perceptions of the Context:**

**Teaching in the "Scheme of Things" at U.B.C.**

For most of these TAs, my request for their participation in this research was the first time that anyone, other than their partners and in some cases their supervisors, had been interested in what they had to say about teaching at U.B.C. In the early part of the first interviews, my questions focused on aspects of planning and preparation for teaching, and management of instruction (Appendix D). All of the TAs had
similarly strong feelings about issues related to these questions in the context of teaching at U.B.C., which they expressed articulately and with fervour. In this they were not unusual among the group of 43 TAs who attended the training programs; indeed, many similar concerns were brought up at the training sessions by TAs who did not participate in this research. Thus, the aspects of TAs' perceptions of the context discussed below are those which emerged from the data as important to them.

Conflicting Responsibilities

While teaching, these TAs were also taking courses and conducting research toward graduate degrees. Five were Master of Arts students, one was working on an M.Sc., one on an LL.M., and two were Ph.D. students. During the interviews, many spoke about the difficulty they experienced in juggling their conflicting responsibilities as teacher and learner, and the stress which this created for them. This concern is discussed by one TA:

I think my motto at the moment is just 'Do the best you can.' Whatever that might turn out to be, it’s my opinion of what the best is, but with the tools that I’ve got right now, it’s definitely a case of just do the best you can. For a lot of TAs there’s a horrible juggling act goes on between the research that your advisor expects you to have done [by] a week on Friday, and the department that believes that a course can be taught in twelve hours [per week]. And that’s what we’re paid. We’re paid as a TA to do twelve hours of work. There’s no way you effectively teach a course in twelve hours, because the amount of time it takes in preparation is just—that’s impossible. So there’s real conflict there. Definitely. (QD1-70).
Support For Teaching?

Few of the TAs believed that the university or their departments considered good teaching to be a priority. For example,

up until just very recently when attitudes, as I say, seemed to change, this university appears to have had no commitment to teaching whatsoever. (QD1/72)

Some expressed such views directly. With others, beliefs about the priority given teaching by the university emerged in their discussions of specific teaching issues. Some examples are presented below.

Relationships with supervisors . . .

As teaching assistants, each of these individuals had a teaching supervisor. The varying relationships which they had with these supervisors emerged as an important element in the extent to which they felt supported in their teaching. For example, one teaching assistant had a good relationship with her supervisor:

Their prof and I do . . . speak at quite a bit of length, we kept in quite a bit of touch about what was going on . . . . she and I both agreed right at the outset [on what] we would consider that we had done a good job. . . . So that was from the very beginning an aim that both of us had, but we both took different approaches to it. So she--comes with a topic which she approaches with empirical evidence in a critical way, right? And they come see me, and I try and sort of follow along with her topics, but I have a different way of coming at it. (KU1/5-6)

Another had quite a different relationship, which led to much soul searching on her part:

. . . I feel that to some extent I'm the instrument of the professor who runs the course and I should probably--I feel I ought to achieve some of his objectives, but because he hasn't told me what they are, it's pretty
difficult to know that I’m doing that. I think my own objectives are so unrelated to the course material that there could be some difficulty for the students—if not quite a bit of difficulty—in knowing, you know, how things I say about them learning for themselves and whatever, how that relates to [this course] and what they’re trying to learn and what they’re being asked on the exam, but if he won’t tell me what the objectives are, then I can’t implement them. But I hesitate to come up with my own objectives just because I’m worried that they may not fit. So there’s sort of I think a gap there and there aren’t clear enough objectives in the classroom. . . . [The professor didn’t give me any sort of outline in terms of material to be covered]. I only knew as much as the students knew, from going [myself] to the lectures. . . . he didn’t tell me more than ‘have fun’. . . (DL1/10,12-13)

Others had relationships with their supervisors which fell somewhere between these two extremes.

Training for teaching.

Apart from the short sessions conducted by the Teaching Assistants’ Union, these training programs were the first indication to many U.B.C. TAs that the university was concerned about teaching, and cared about what they did as teachers. As one TA put it, in discussing the training program:

The value of meeting other people who have had the same, exactly the same problems, found themselves in exactly the same situation not knowing what to do about it, that same feeling that this university doesn’t seem to care what on earth we do when we go into a classroom, haven’t bothered to tell us how to do it, and . . . there were a lot of people there with a lot of experience who, like myself, have taught classes, and we all knew something wasn’t right [in our teaching], and in some it took only three days to fix that, and my comment on the evaluations . . . was, ‘Too bad this didn’t happen [X] years ago when I was teaching my first course.’ A lot of students have gone through my lectures in [X] years, and I really can’t help but believe that if I’d taken that course [when I began teaching]—I really believe right now that I could have done a better job for those [X] students that I’ve dealt with over the last [X] years, more than I did. And I would not hesitate to recommend this to anyone else. . . . I really hope that it’s going to be continued . . . and expanded. (QD2/64)
All nine TAS viewed the training programs as signs of a changing university attitude toward teaching, expressing hopes that the program would be continued, improved and expanded.

**Standards for evaluation.**

One aspect of teaching that was of major concern to all nine TAS was marking and grading. None were given either departmental or course guidelines for evaluating students' work, although some departments had established standards regarding the number of high and low marks that were to be awarded. Consequently, the teaching assistants were struggling to articulate their beliefs about grading, to develop their own criteria for marking, and to decide how they would deal with students' responses to the grades they were given.

Two had developed clear evaluation criteria and felt that they had worked through the issues involved with respect to marking in this teaching context:

... if I don't give them the feedback of the quality of their abilities, then I'm doing them a disservice, and I'm doing a disservice to the people who are doing an excellent job, if I give those other people the same mark. So the reality of university is you get marks ... I can stand outside of my feelings about them and my wish for them to be doing well, and my wish that I could give them a first [class] mark, and just do the deed and give them a mark that's not as good. (QE1/10)

... I don't see being a soft marker does anything for the student in the long haul, because they have to take another course after this one, and they're going to crash. Somewhere along the line they're going to crash. (QD1/35)

Despite this personal resolution of the issue, however, problems still existed with respect to departmental standards:

There are no guidelines in this department whatsoever currently on how to go about grading that [common] exam.
... I know people who passed with grades of less than 40. That's because this department has no control whatsoever. ... I am interested in how many first class marks somebody else's class of the same subject got, in the sense that they didn't deserve that first class, that bothers me, because that student got a higher grade by virtue of the fact they took the course from another instructor. (QD1/65-67)

Other teaching assistants were less clear about this aspect of their role as teachers. Some were dealing with the issue of wanting success for all their students:

... it's the grading and evaluation part that I have a difficult time with. I guess that's the only part that--I'm too soft on that. You know, I'd like to see everybody do well, but--I know that some kids will not do well in a testing environment. People will not do well. And a lot of it has to do with low expectations. You know, 'I'm not going to do well on this exam,' and then they don't, right? They live up to their expectation[s]. (TQ1/63)

Some had not yet developed criteria with which they were comfortable, were still debating the issue of grades as an aspect of university, and/or felt constrained by departmental limitations concerning the range of marks which could be awarded.

... I like the marking least of all. I like assigning the grades least of anything. I think doing that I'm always wishing that I could sit down with people and sort of say, 'Well, why did you write this this way and what would have happened if you'd done it that way?' than just to sit there and say 'B-' and then give it back, and know that that's going to affect people, and that I've done it, and that it's so arbitrary. That's what I like the least.... that I say, 'Well, I'm not allowed to give too many A+s--I'm not allowed to give any. Maybe I can give a couple of As, but I know that I'm supposed to have most of them in this particular range, so OK, how can I set them up? It all depends on who has written what. Maybe--it seems to me anyway--maybe it's just a fault of inexperienced markers, that I look at them all and say, 'Well this one's the best one so I guess it gets the highest mark,' and I just sort of work them all out relative to each other. That seems arbitrary to me. (DL1/32)
I absolutely hate [marking the essays]. I really enjoy reading them, but when it comes to assigning marks . . . . I don’t have an entirely free hand when it comes to marking. I can’t give a lot of As for example. If I give more than [one of each] A+, A, A-, my prof will say, you know, ‘Oh you gave a lot of As. Were they all that way?’ He won’t necessarily ask to see them, but he just kind of wonders. (KC1/62-63)

And I do not like marking their essays . . . . I liked reading their papers, I liked responding to them and that kind of thing, but assigning them a mark was really kind of a drag, because . . . you’re not supposed to give them a perfect mark and . . . you’re not supposed to give them a terribly low mark. Like you know the standards in the department, right? They want to end up with an average of 72% or something, . . . and I’m the TA, and I’ve got 20% of their mark, and [the prof] . . . told me that she didn’t want these marks to be low and she didn’t want them to be high, right? So I had this, you know, constriction, and--and unfortunately their performance in the class, in their writing was [as] if you put it on a curve. (KU1/65-66)

For many TAs, providing feedback to students on the quality of their work and how they might improve that work was not problematic. The difficulty came when they were required to formally award grades.

Discussion

This group of TAs appears similar to those who have been examined by other researchers. The nine teaching assistants who participated in this research came from eight different departments and/or faculties. Working in a variety of settings, they taught a range of content to first through fourth year undergraduate students. At the same time they were working toward various graduate degrees, experiencing the stress of juggling conflicting responsibilities and roles. In speaking about their relationships as teaching assistants with
their departments and/or their supervisors, few believed that the university considered teaching to be a priority, although the teaching training programs were perceived as evidence that this might be changing.

Global Conceptions Of Teaching

Conceptions, as "abstract, cognitive representations of a phenomenon" (Pratt, 1992, p. 220) are thought structures, 'filters' through which individuals interpret their world. Conceptions represent characteristic ways of understanding a phenomenon; they do not represent characteristics of individuals (Marton, 1981). Consequently, it is possible to hold more than one conception concurrently, despite the unique features of each. Conceptions have been found to change with the context in which respondents find themselves (Saljo, 1988), and to vary with new learning or experiences (Marton, 1981).

Global conceptions represent researchers' attempts to formalize their understandings of the conceptions held by their respondents (Beaty, Dall'Alba & Marton, 1990). Because researchers differ in how they characterize conceptions, different global conceptions may be used by different researchers to describe the same conceptions.

In interpreting global conceptions in this research, I returned to the categories of beliefs about teaching identified in Chapter Two. Based on the elements of teaching (Pratt, 1992) and the aims and elements of education (Zahorik, 1977),
these categories include beliefs about: (1) learners, the learning process and learning outcomes; (2) subject matter/content—what is to be learned; (3) teachers and teaching—responsibilities, functions and the teaching-learning transaction; (4) aims and ideals—goals and purposes of teaching; and (5) context. Given the similarities among these categories across previous research, I assumed that similar categories of beliefs could be identified in this data. Thus, I used the categories of beliefs as a guiding framework in characterizing the four qualitatively different conceptions of teaching. The global conceptions which characterize these conceptions are: (1) Communicating Content—Sharing Concepts, (2) Contextualizing Learning—Knowledge in Action, (3) Developing Scholars—Advancing a Discipline, and (4) Inspiring Learning—Honouring Curiosity. In the descriptions below, each aspect of the conceptions is presented and illustrated with one or more representative quotations. Each description concludes with a discussion of the general groups of beliefs, and the specific beliefs within those groups, which were used to define and characterize that global conception.

**Communicating Content: Sharing Concepts**

The focus in this conception of teaching is on

(1) content:

Content is what we’re trying to come to terms with . . . . We have certain material that for some reason or other is our goal to cover. (KU2/24)

and (2) communication of that content to the learners:
At the start of the lecture you’ve got however many people in front of you who are not aware of or do not understand the concept. The teacher does understand the concept. An effective teacher will illustrate that concept and explain that concept in such a way that the students go away knowing what the concept is and understanding what the concept is. (QD1/21)

Individuals with this conception of teaching have two goals for their teaching: (1) to interest learners in the material, and (2) to prepare learners for examinations or other forms of evaluation.

... really I think the goal here is ... twofold. First of all to try and impart to them some knowledge of [X], and try and get them interested in the subject which ... is very difficult to do, but also in doing that, realize that they are going to be evaluated on their knowledge of this course, and that part of what I have to do is prepare them for that evaluation, so it’s twofold. (QD1/27)

In attempting to meet the goal of interesting the learners in the content, the teacher

act[s] sort of as a catalyst in the learning process ... sort of as a connection between the content of the course and the learners. There has to be some ... positive sort of feedback or relationship or interaction between the teacher and the learners [so] that people will have a good feeling about the course and they want to go there, they’re interested in it. (ZZ3/6)

In some cases, preparation for evaluation is given the higher priority, perhaps because the TA is less certain of her/his ability to interest learners in the material:

I have to ... help them get through their exams and hopefully help them--inspire them to learn more about what they’ve been taught here. (TO1/12)

The communication which takes place is understood to be primarily one-way, from the teacher to the learners:

... the students will learn something from [the teaching] because the teacher will have given them the information ... (ZZ3/9-10)
However, some limited two-way interaction also occurs. This consists primarily of questions about content from the learners:

I am a teacher who wants to interact through questions to aid learning. Questions to the students when you're giving a presentation . . . and then having them ask questions [in response to your questions], or having them ask questions if they don't understand something. [That] sort of flushes things out, I guess, if people ask questions, that you might not have originally remembered something or a question will bring that out. Something to further expand upon the subject. . . . [Questions help to] sort of get [learners' minds] sort of into that synthesizing mode as far as that subject material is concerned. (ZZ3/29-31)

Sometimes the two-way interaction consists of suggestions to the teacher from the learners about how best to communicate the content:

. . . certainly what I'm learning from them is how to communicate the idea, for sure. It's not that I don't know the idea, but it's the way the idea is put across . . . (QD1/59)

Individuals with this conception of teaching believe that it is important for teachers to both know the content well and to be able to effectively communicate their knowledge of the content:

. . . the test of any understanding of concepts is being able to communicate those concepts rationally to another individual, and that's what's necessary in teaching . . . when you’re teaching you should have a . . . more general understanding . . . the more general understanding you have of the concept and how it fits into the laws of nature and so on, the better off you are, and the more easily you can explain the concept to other individuals and draw on analogies from everyday life and so on. (T01/30)

Teaching is more than simply knowing content--it is understanding how to communicate and share that knowledge:
I find I can’t teach unless I know [the subject] well enough to understand where the pitfalls are, and to understand where the difficulties are going to be coming down the tube, because when I learn it well enough—that’s the way I approach it—I’ve got to learn it well enough so I could figure out a way of teaching it. Okay, this is going to be the best way of teaching it, this is how I can connect with them . . . . this is what I’m going to teach, how I’m going to teach. (TQ1/64-65)

It is difficult to communicate content well:

. . . I mean, if I go in there [as a teacher], I understand the concept, so it’s entirely obvious to me what’s going on . . . perhaps the difficult part is getting at their level, is understanding the level which they are at and trying to communicate in a way that they understand. (QD1/22-23)

In communicating this content, the teacher is responsible for structuring the material to best communicate it to the learners:

I mean, they know that this is an educational institution, they know that they’re going to be examined on stuff. You should help them structure in their mind[s] what the course is about. They shouldn’t have to go home and sort of go, ‘What is he talking about? What is this course about? . . . They ought to go home with some sort of structured notes and go, ‘Oh yes, okay, yeah, mm-hmm,’ you know, and learn, right? (TQ1/28-29)

Communicating the content well may require rewording, repetition and/or presentation of the material in different ways:

A lot of them cannot understand what the book is saying. So again, another aim in my lecture is to chew [the material] all up in some sense and try and throw it at them in a different way. (QD1/10)

I’m a teacher who wants to make material accessible or interesting through the use of examples or experiences . . . bringing up things that [the learners] have encountered every day, . . . or else relating one’s own experiences. It gives them . . . something they can visualize, for something that’s relatively abstract . . . if you give them something that they know about, that’s familiar, then that should aid the learning that they’ll be able to identify it, they can think about it,
visualize something. And it sort of helps your ability to give them the information, to help them learn. (ZZ3/31-32)

... the teacher has to adapt the content to his students' background ... in terms of what applications are used to illustrate ideas ... (QD3/A)

It may require providing opportunities for the learners to work with the material, "to try it out." One way of trying it out is to help them work through problems:

So my job, really, is just to help them with the first one or sometimes two questions ... so at the beginning of the class, typically I might write down some of the more useful equations that they might use, or concepts ... that might help them ... There is a sort of format that you should really ... that’s useful in setting up these problem-solving solutions, and so we go through that too ... (T01/2-3,5)

Another way of trying it out involves discussion:

What I try to do is get them to take the stuff that they’re learning, from reading in texts and from ... doing their lectures with their professor, and try it out, you know? And it seems to me that if they try it out, if I can get them to try and talk about it with each other, with me or whatever, that it firms it up a little more in their mind, that it gives them a little further grasp of it, and maybe in particular that it gives them questions, hopefully they’ll return to their material and look at it again, having done this little exercise of trying it out. It gives them a little bit of a different format to work with the same material, and then I think that helps to kind of ground it, you know? (KU2/7)

In a sense, teachers are like tour guides on a bus tour, where everything that will be seen and done is known and planned for ahead of time:

... teachers are sort of like tour guides. 'Okay, we’re going to talk about that today, I’m your tour guide today through [X], these are all the problems, those are the signposts, this is how you do it, you know, this is what the test is going to be about, and this is what you should learn.' (TQ1/32)
However, it is not enough to know the content, structure it, and communicate it well. Teachers must also be interested in and enthusiastic about both the content and the students' ability to learn the content, and be able to transmit that enthusiasm and interest to their learners.

I am a teacher who enjoys teaching [because] it's bringing someone from a point where they don't know to a point where they do know . . . . I just get satisfaction out of sharing that knowledge [about things that I know about] with them. (TQ3/27-28)

Teaching assistants with this conception of teaching are concerned with transmitting both their enthusiasm for the content and their desire for their students to learn the content. At the same time, however, they do not believe that it is possible to teach in a way that will please everyone.

. . . the students that you teach, they come from such a diverse background that there is no way that what you do everybody's going to like. That's an unreasonable goal . . . . if I can get the majority of the students in the class happy with what I'm doing and the way I'm doing it, then I'm doing all right. (QD1/17-18)

. . . I think it's fair to anticipate or to expect that, you know, students will have to be kind of resilient and deal with the different ways that people go about teaching, and the different kinds of things that they [do]. (KU2/17)

Individual learners are expected to take some responsibility for their learning, both in their attitudes and in their actions.

. . . . the teacher has got some responsibility in opening up the learners' view, I guess, by bringing up certain things . . . . the learners might not have thought of that might have been motivating for the learners. But . . . . I think that it's reasonable for a teacher to go into a learning environment and expect the students to be motivated to learn. I think that's reasonable . . . . at a university level, you know, there's only so much you can--time you can spend on trying to motivate your
students. They’re adults. So—and they should be treated like adults. (T03/22-23)

... [learners have] a certain amount of individual responsibility ... showing up for classes, doing readings, attending labs, doing assignments. (ZZ3/13-14)

Further, learners have a responsibility to ensure that they understand the material that has been presented to them, and to come and seek help if they do not. At the same time, the teaching assistant has a responsibility to provide that assistance.

I think there’s a responsibility on the student to go away, say ‘Well, what was the point of today’s lecture? Do I really understand what went on today?’ One way I encourage my students to do that is to try the assignments ... if they can do the assignments, then there’s a good chance that they’ve understood what’s going on ... if they get a question wrong ... there’s two things they can do. First of all, I give solutions to the assignments, so they come and take a look at [the answers], and if they still don’t understand them, I put 100% responsibility on the student to make the effort to come and see me. Now, I make myself easily available, I set up my office hours in such a way that there is no student in my class who can’t come to at least one of them, so if they’ve gone away and in six weeks time they come to me and say, ‘Well, I never did really understand what happened in Chapter whatever it was,’ then that’s the student’s problem, I think. If the entire class comes to me in four weeks time and says, ‘Oh, we have no idea what went on in Chapter Five,’ that’s probably my problem in that I haven’t seemed to do a very good job, but you know, between one or two students, it’s definitely their responsibility. (QD1/24-25)

One teaching assistant summed up her understanding of teaching from this conception in this way:

[As a teacher you] synthesize the material and then you have to communicate that to the learners, to organize it, to make it interesting—and to be able--yeah--to communicate it effectively and then answer their questions or sort of--make--attempt to make them enthusiastic or pique their interest in it [by] present[ing] examples, and then just to appear enthusiastic. To appear knowledgeable about it and then at least interested in whether they’re assimilating the
information . . . and then seeing whether, from their feedback--whether they're understanding it. And then which in turn will--they'll absorb--they'll absorb the knowledge, the information and then--which might make them interested in like pursuing it further. (ZZ3/5-6)

Within the general framework of the categories of belief guiding this interpretation, specific beliefs from each category define this conception. To begin, the ideal or purpose of teaching is communication of knowledge, or content, to the learners. Knowledge consists of products or skills that can be transferred from one person to another.

Teachers have a variety of related roles and responsibilities. They are to interest learners in the content and to prepare them for evaluation. They are responsible for successfully communicating and sharing knowledge; thus teachers must know the content well to be able to structure and restructure it to best communicate it to the learners. Teachers are responsible for motivating the students, and for providing help as needed. However, teachers can not expect to succeed with all students; success with a majority is the best that can be achieved.

Learners are responsible for being prepared to learn in their attitudes and their actions. The teaching-learning transaction is primarily one-way, with the teacher communicating content to the learners.
Contextualizing Learning: Knowledge In Action

The focus in this conception of teaching is on facilitation of understanding to foster the learners' abilities to apply what they have learned in the "real world," when the teacher is no longer there to assist them. Teaching is seen as being composed of two parts:

. . . there's two parts to teaching, right: there's a mechanism [a tool] that we give a student [to use in the real world], and there's a concept. (TQ1/12)

What the learners apply in the real world may be

(1) knowledge:

A basic goal, I would say, would be that a student would get information out of the class they were taking that would be applicable to their everyday life. So that it would make them better, if they're going into something other than academic studies, where it would make them better at the work that they do. Maybe they're going to be managers or something, make them more aware of differences in people and of their own personality. So just take away data that would be useful in their everyday lives, make them better, you know, consumers or make them better voters so that they could tease apart arguments . . . (QE1/31-32)

and/or (2) the mechanism or tool which helps the learner to understand:

. . . but ten years from now, when they're reading the paper about--university employees going on strike over issues of equal pay, will they have any ability then to sort of think about it, you know? Because that's what's really important. To each of us as individuals that come here as students, right? If we just walk away with a bunch of facts it's going to be all outdated, you know, in a little while. But if we walk away with a way of understanding new statistics or groups of ideas or whatever, working them out, then we'll have that forever; we'll always have that. (KU2/61-62)

The underlying belief is that knowledge is to be used, not stored away. What students learn--both tools and concepts--can be meaningful and useful to them in their lives.
what do you do with knowledge? You don’t stick it in a computer and leave it there; that’s not knowledge, that’s storage, right? You plug it out there somewhere and you use it, right? And if you teach your students that that’s what we want you to do is store it, I mean it’s a pointless exercise, and they know that, right? . . . you’ve got to connect [the knowledge] with their personal reality so it makes sense to them, so that that tunes in to their desire to [learn], you know. (TQ1/25-26)

Students’ motivation for learning is believed to be strongly affected by the extent to which they understand how what they are learning will be useful to them in the future.

... the idea in my mind behind learning [X] is that it is something which they should find useful in their own fields . . . . I think it would be much easier to grab their interest if I could motivate the thing by example and not by [X] . . . . I would like to be able to do the whole thing from an application point of view . . . rather than [application] being something that’s tacked on at the end. I think it would be much easier to grab their interest, much easier to motivate the whole thing. And for them, to see the purpose of what they’re learning. (QD3/3-4)

The teacher’s ability to help learners understand the connections between what they are learning and the outside world is crucial.

What they’re really learning though is, in their world, where to prioritize that [X] . . . . Is this really important to me? And so the relevant connection [is] between what’s been taught in class and what they’re going to actually do with it, you know. . . . So that’s where the teacher’s ability to help them prioritize that information, help them understand the connection to what they’re learning and the outside world is so relevant. Otherwise, the content of their learning becomes almost, learn it today, forgot tomorrow. (TQ3/7-9)

A teacher within this conception sees knowledge and ways of using knowledge as important, and helps learners relate the knowledge to their lives.

... I encourage the students to find applications for their knowledge . . . or problem-solve--with things that
seem to be stuck or deadlocked. [And that is important because] I think that they don’t necessarily just want to take the information of what’s going on in the status quo. I think they need to--I mean, they’re going to be citizens. They are citizens. They have opinions about things. What are they going to do with those opinions? If they ruled the world, how would things change? So I think it’s important that they would possibly make a change, but also that they would be able to see possibilities of change and that they would feel like they had some sort of power to exercise. (QE3/49-50)

Overall, helping students learn to apply tools and concepts in the real world is difficult, because in the end, the students have to think for themselves.

... today he saw the application in a different situation... he’s gone beyond just what I’ve taught... [to identify] another application... that he could see... And that does make teaching difficult because in some sense, that kind of connection, that kind of application has to be made by the student... And that is the level on which a lot of students are not used to working, where they have to discover things for themselves. That is hard... You don’t have--sort of this railroad along which the student can go, you never come off the track and you’re going to be okay. The students have got to learn to leave the track and to look at what’s off on the left and the right, and that’s something that a lot of students do not seem to do easily... I find very hard to get across to them, that they have--in some sense have to think for themselves. (QD3/30,32-35)

While the same groups of beliefs guide this interpretation, the specific beliefs defining the conception differ from those identified in the Communicating Content conception. The ideal or purpose of teaching is to facilitate learners’ understanding and application in the "real world" of what they have learned. Knowledge is to be used by learners in their lives, not stored away and forgotten; thus knowledge and ways of using knowledge in context are important.
Teachers are responsible for helping students understand the connection between what they are learning and the outside world. They help learners relate knowledge and ways of using that knowledge to the learners’ lives. They are role models of how this can be done. Teaching is difficult, because of the diversity of the learners.

Learners’ motivation is strongly affected by how well they understand how and why what they are learning will be useful to them in the future. The extent to which they realize that ultimately they will have to think for themselves also influences their motivation.

**Developing Scholars: Advancing a Discipline**

The focus in this conception is on helping learners develop the ability to think and work as scholars, members of the academic community.

Academically, though, they could stand above a body of knowledge and be able to see the trends in that knowledge. Be able to contrast different schools and see similarities as well. Be aware of . . . things that they need to learn about how to do research. How to plan their time . . . (QE1/31-32)

Helping learners do this involves helping them discover

(1) their own intellectual questions:

. . . . something that a very clever teacher would be able to do would be to sort of nudge you a little closer to what was disturbing you, so that it maybe came into your field of vision or something . . . . a good teacher helps you discover your questions. (KU1/44-45)

. . . . I introduce the learners to the content--and let them experiment with it--and--come back to me with what they’ve found or what they haven’t found. And I think then my primary responsibility is to put that content in to . . . . some sort of overall context . . . . Learners
can make the contribution to the context too. . . . My primary role is to be a facilitator . . . . [My goal for my learners is] to give them the skills to learn [the content] independently and to know which questions to ask. I think that’s the critical thing--is knowing the questions--not knowing the answers . . . [is being able] to tell what is more relevant from what’s less relevant. They would be able to think laterally instead of linear think . . . probably what I’m talking about is creativity . . . knowing where to look. Not knowing that in 1858 this happened, that happened and the other happened. (MD3/1-3,5-7)

and (2) how to begin finding answers to those questions in ways which are accepted within the academic community:

I’m a teacher who draws on a broad range of subjects . . . and I don’t--at least I try not to compartmentalize. If I think it’s appropriate, I’ll draw on my knowledge of physics or economics. Or art. Or baseball. Or what have you [because] I think the more connections you make, the greater your learning skill. And to me in research, depth is important, but also lateral thinking. Being able to draw on other similar things about similar methods about different things. (MD3/30-31)

Individuals with this conception want learners to become more independent and creative in their thinking, and teach in ways which promote that:

I’m a teacher who’s demanding of students intellectually . . . I think it’s hard for some of them because they come to get, you know, some sort of a list of answers to go and write an exam with . . . . I insist that they think about . . . underlying assumptions and that they try and engage themselves with the material that they’re looking at . . . . What I want from them is how to explain this now. Not--‘there’s a difference.’ I mean, that’s easy. Now, ‘how are we going to explain it.’ And I think that’s fairly demanding. (KU3/68-70)

I’m a teacher who frequently responds by saying, ‘What do you think?’ And I try to make it clear to students that when they ask me a question I would like them to have done something first. I would like them to have tried something else first. (MD3/41-42)

. . . a more casual approach that really puts more of the responsibility back on the students will get them learning better and becoming more independent in their thoughts . . . . when I don’t know the answer to
something, either I’ll say, ‘Well, I’ll ask,’ but more likely I’ll say, ‘Well, where could you find that out?’ (KC1/55)

At the same time, they want to help their students develop an enthusiasm for creating and furthering disciplinary knowledge. Sometimes, this discipline is the one in which the teacher is interested, and learners and teacher may come to share similar interests:

Content . . . would . . . be some general thing that we’re working on that we each [myself as teacher/facilitator and the students] would have different relationships to . . . . Some relationship with the content persuades us to have some engagement with it and with each other. (KU3/3,6-7)

[Teaching is] creating a shared experience out of something that was individual. So it’s--you know, if you’re a physicist and you know about some formula and you teach it to someone, then you’ve--you know, you’ve helped them share in physics to some extent. (DL2/58)

In other cases, the goal may be for students to become enthusiastic and interested scholars in any discipline which they as learners find intriguing.

. . . if you can think critically you can read about [X] and figure out what you think about it. You know, figure out if it’s useful to your own analysis, etc. . . . It seemed to me the best that I could do, especially as their tutor, was to try to give them some kind of a [way of thinking] which they could use in their undergraduate education, which they were just beginning, most of them. (KU2/30)

. . . to teach is . . . more than imparting knowledge . . . in the long run it’s to develop reasoning skills at the level that they’re to a slightly higher level each time. Basically reasoning skills I would say, because especially in our times, you can’t know all there is to know. They can just get a handle on what they want to know about. (QE1/35)

The ability to think and work as scholars is seen as much more important than simply knowing content:
I'm not looking for a brilliant insight about [X]. In a way I don't care what they think about [X]. They have their own opinions, whatever their opinion is is fine. All I care about is that they have an opinion, and if they don't have an opinion, how can they get one? So the moment when somebody suddenly has an opinion or figures out how to get an opinion, figures out that you can have an opinion about something, then that's really great. (KC1/61)

... what we really wanted to see happen in the class... was that if they showed signs of developing an ability to think critically and analytically, that that was what was important to us [in this discipline]. More so than they learn a bunch of silly statistics and definitions and stuff like that. If they had developed some sense of criticalness in how they approached social topics. (KU1/5-6)

... imparting knowledge is not the only goal here, they can find their own knowledge, it's helping them think... reason out different arguments. See different shades of an argument, see the possibilities for agreement and possibilities for differences, but not--not the kind of black and white viewpoint. So... it's not just teaching a skill that is cut and dried, it's helping them develop cognitively, basically. And emotionally. Just in every way, it's helping them develop as a person. (QE1/9)

... I take a holistic approach to learning and knowledge. It is not only facts, but a way of thinking, approaching things, dealing with other people...

(MD1/4)

Individuals with this conception see the teacher as a university scholar, modelling forms of inquiry and ways of knowing--a role model. Such a scholar is committed to learning more in a discipline, "a co-conspirator in the game of learning" about knowledge.

The teacher is just sort of--not so much presenting knowledge as modelling a way of acquiring that knowledge...

(DL2/50)

... I think the best thing that we can do as teachers is to explain that commitment, where it comes from, what it's about... [My own commitment is] a commitment to learning... struggling to come to terms with things, to understand, a kind of quest, you know, that happens a
few steps at a time, . . . [which] eventually comes together, which is then this kind of commitment . . . for a lot of people to a theoretical perspective . . . . That whole thing would just continue to grow and build as long as we keep [being academics] and keep wanting to do it and enjoy it, so not necessarily as students, but as teachers or researchers or whatever. (KU2/65, 67-69)

. . . [I consider a teacher] to be a co-worker of some sort, a co-conspirator in the game of learning . . . . if [the learners] feel that the teacher is engaged in a compatible process of their own, then they won’t have the sense that they’re only learning things to please the teacher. They’ll have more of a sense that they’re learning them because they’re good things to learn, that they’re interesting and they’re useful and the teacher is somehow modelling that process, but it’s still part of the same process . . . the subject [becomes] the common goal that they share. (DL2/34-35)

Scholars are people who are always learning and growing in their understandings of their disciplines:

. . . personally I feel as a teacher when I try to teach people [X] or something like that, right, that I learn a lot from trying to teach it. I even learn a lot from trying to teach what I’m doing here . . . . The more command of [the content] you get, the more you become confident with [it], the more it opens up and there’s more to think about with it and so on . . . a good teacher would always be learning and developing their own thinking around what it is they’re working with, right? The student’s dealing with the same material, maybe in a different way, but it’s still the same material, it’s still the same concept . . . . their questions that they ask about it make me start searching around and comparing it with other things or discovering . . . all those different ways [that] . . . the word doesn’t make any sense to them . . . or what the potential questions are, what the potential arguments are. (KU2/23, 26)

Such a scholar is also committed to helping students become scholars themselves:

I’m a teacher who cares about students . . . . I try to look on them as colleagues . . . I care about their welfare, and I demand things from them but I’m also willing to give quite a lot too. . . . I think it’s important for somebody who’s an instructor to get across to the students that there is a certain amount of caring, corny as it might sound, because that caring then becomes
two-way, and you begin--they begin to care more about
what they’re doing. (MD3/39)

The process of helping learners develop into scholars
requires that their input and views are respected. With this
respect comes the responsibility to help them examine and
question their views as they question other knowledge:

... it’s very rare that a student just says something
for the sake of saying something. They obviously think
that what it is they’re saying is pertinent to the
discussion for some reason. So if it sounds like off the
wall to begin with, it’s only fair to encourage them to
elaborate [so that] we’ve understood how they see that
link. And you know, it’s safe to assume that it’s there
for the student. (KU3/47)

... you must be very accepting of views other than
yours, differences between where the students are coming
from, and bring them all into the discussion. (MD1/3)

While the teacher’s understanding of the content is important,
learners’ preconceived notions and understandings are also
important and to be discussed and questioned:

... the learners have always come in contact with more
or less of the content already and maybe the teacher’s
definition of what makes up the content isn’t the same as
the learners’. So the content to me is quite dynamic in
that the learners may think that it’s one thing, the
teacher may think that it’s another and both of them may
already have some of the content as part of themselves.
... maybe part of the job of the teacher is to define an
area of content ... for the students so they can see
something that they want to try and get rather than just
how they feel in that they’ve already go it .... But I
would also see it as quite important to find out from the
learners how they define the content. What it was that
they were trying to get that they thought I had to give
them or that they thought was there for me to help them
get. (MD3/6-8)

... I’m really trying to get them to teach themselves
and each other, and yet they’re in first year, how much
do they know? Well in a way they know a lot, they just
don’t know they know it, so teaching them that they know
something about something is kind of what I’m hoping for.
(KC1/47-48)
Asking learners to challenge and question their own understandings is asking them to take risks, often to question underlying beliefs which they may not have consciously thought about or previously articulated. Teaching assistants with this conception consider themselves responsible for making this process as comfortable as possible for their students, given what is involved.

. . . my responsibility is to help students feel safe enough to put something of themselves into the discussion, to get them to question, and to show them how to question. I do that by being evocative, trying to generate interest and enthusiasm, by being open to different views than my own, and by giving them something from myself—information. (MD1/1-2)

Overall, in developing scholars, two things are important:

. . . the most important thing [in their learning] is, do they have ideas and can they communicate them. I don’t really care if they felt this or that . . . it’s more just my overall sense of what they’re trying to do and why . . . trying to express ideas . . . I care more about that than what they actually say. (DL3/49-50)

This conception can again be defined by specific beliefs within each category of beliefs identified in Chapter Two. The ideal or purpose of teaching is to help students think and work as scholars. Content or knowledge is important, but understanding how to inquire into and question that knowledge is essential.

Teachers are responsible for helping students discover their own intellectual questions, and how to begin finding answers to those questions in ways accepted within the academic community. Teachers are role models with high expectations.
Teaching has two goals: to help students become more independent and creative in their thinking, and to help them develop an enthusiasm for creating and furthering knowledge. Learner diversity, within the academic context, is encouraged, and a safe environment for trying things out provided.

Learners are responsible for taking risks, and learning to question their own input, views and pre-conceived notions as they question other knowledge. The teaching-learning transaction is an interactive process of the teacher communicating knowledge and modelling ways of thinking about that knowledge, and the learners questioning and trying out the ways of thinking modelled by the teacher.

**Inspiring Learning: Honouring Curiosity**

The focus in this conception is twofold: (1) getting students excited about learning--learning something, learning anything:

... that's what education is about to me, you know, is learning how to teach people to be excited about learning, because you never stop learning. And when you stop learning, you're dead ... If you can't teach people how to be excited about learning, you know, you shouldn't be a teacher ... because learning is great. (TQ1/31)

and (2) helping them learn how to learn, so that eventually they will be able to learn without teachers. Teachers can either: (1) teach students how to learn a particular subject:

... teachers ought to teach people how to learn ... any subject, whatever subject, teach them how to learn that subject. They ought to ... be able to go away from your subject knowing how to learn in that subject, knowing what learning is about, because that's what we're doing all of our lives, we're learning. (TQ1/68)
... [helping] the students learn ways of arriving at the answer ... is more useful than just sort of learning what the answer is. (DL2/53)

or (2) teach students general principles about how to learn any subject:

I enjoy assisting people to do things that are difficult for them to do, helping them to help themselves. ... The subject matter/content doesn't matter, if they know the principles, they know where to find [X]. Teaching is directed toward helping them learn about knowing how to learn. (MD1/5)

In becoming excited about learning, and learning how to learn, subject matter is not important--ways of thinking are. Subject matter is merely the vehicle on which to practice the process.

... one of the things that I aim at as a teacher was [for the learners] to come from the classroom situation, especially by the end of the year, with some kind of permanent skills to carry on with in the learning process ... something that [they] can take away and use for the rest of [their lives] ... the aim is not to leave, necessarily, with a list of things that you're knowledgable about. Because really, that's not very useful ... [rather] it's about learning and how [to] learn--how [they] might go and teach [themselves] ... learning about learning. (KU3/11-13)

Individuals with this conception believe that people will be learning throughout their lives, that learning is part of what makes life exciting, joyous and empowering, and that those who love learning will enjoy their lives more.

... learning [is important]. I sort of think it's probably the best and most exciting thing people can do ... because it's so stimulating. It's sort of what keeps ... people in general from being bored, from being passive, from being disempowered. I think that learning enables people to be a little excited about the world and other people and themselves and that that's sort of the point of it, just the feeling of active excitement it creates. (DL1/30)

... we focus far too much on what they're learning, as opposed to how you learn and the process of learning and making learning exciting, you know, because learning is
Learning is a cooperative process, with everyone learning something from everyone else.

Teaching is a way of expressing an interest in learning, and that you can learn by teaching things, and that you can teach things as you learn them . . . I don’t think the two roles [teaching and learning] should be as separate as they are. I see them as more intertwined. So I guess ideally I’d like to see the students who are there ostensibly to learn also being able to help each other learn in that way. I guess the responsibility of teaching is shared among the learners and the teacher—the official teacher—and everyone else. (DL1/8-9)

I learn as much as I teach. Teaching is like a conversation with twenty people at once . . . I’m a resource for them and I’m there to learn as much as they are . . . . Students have as much to offer as I do as teacher. (MD1/1,4)

The power relationship between the teacher and the learners is of minor significance; acceptance of people as equals, all learning together, is key.
Really, [the learners] are the ones--they’re the ones that are at the centre. It’s not my performance, it’s theirs. I’m there to help things. (MD3/10)

. . . I so strongly don’t see myself as a teacher . . . . I see myself as a resource [who is] helpful and encouraging and approachable . . . . ‘Teacher’ to me seems like ‘instructor.’ It seems like, you know, there’s the teacher and the teachee and there’s a big table between the two. So I’m reluctant to put a table between me and whoever I’m talking to. (KC2/35, 39)

The course or class is seen as "belonging" to the students, because they are the reason for its existence, the ones who have the potential to gain the most from it.

I have to keep coming back to the primacy of learners and I really do feel that even though the teacher is in charge, it’s the students who really matter in that situation, and it’s their needs and their goals that have to be met . . . . Teaching . . . should be inclusive, it should be designed to admit anyone who wants to get in into the world of learning. (DL2/56)

[I try to create a feeling of ensemble or community because] I really want them to rely on each other and not on me . . . . this whole sense of working together, their class not mine . . . when you don’t know something, don’t ask me. If you can, ask someone else . . . . that community makes them feel better about asking each other to do things to help them out, and also to help other people out . . . (KC1/34-36)

Teachers are facilitators who act as resources and use their expertise to excite and inspire the students, while helping them learn how to learn.

. . . I don’t want to be lecturing at them. That’s not going to help them learn as well as if they--struggle with the information and with each other’s responses. And if I just moderated something. (QE3/22)

The teacher is also a role model who is personally excited about learning and about different ways to learn.

. . . you can’t teach people how to be excited about learning, you’ve got to show them how to be excited about learning, you know? (TQ1/67)
. . . teaching is more than just what you learn and what you're teaching. The teacher is a person and a model and a--you know, and a member of this learning environment. . . . a teacher in a fuller sense of the word is a role model . . . so that when [students] leave this teaching environment, that they know how to do that themselves. They don't need a teacher, they can just go and do the learning and find the material and do the learning. (TQ2/26-27)

Ultimately, however, students are responsible for their own learning.

. . . I think I have a certain responsibility to--like to be there for example, to have something to do, to have some idea of what is relevant to the course, what's relevant to them, what will be useful and what will provide them with some kind of interesting situation to find themselves in to learn something from, and then beyond that, beyond me being there and me having something in my head to do, I think it's up to them what they want me to do after that [in helping them discover things]. (KC1/72)

I believe . . . the more responsibility you give people for their own destiny as it were, knowing they can come if they want help, but not demanding step-by-step accountability, I think the more responsibility [they] take and the better job [they] do. More learning skills are internalized for themselves. (MD3/49)

. . . educating them is giving them responsibility for their own learning, sort of helping them to see that--essentially who they are is up to them, and if they want to learn about something they can, that it's sort of out there and that there are ways of finding out about it and that, you know, whatever it is, they can pursue their curiosity . . . . They've acquired learning skills that will make it easy for them to learn whatever they need to learn. So I guess in a sense to me, all education is geared towards helping people learn how to learn. Hoping that once they have that . . . then they can go and learn whatever they want to. (DL1/40)

Teaching from this conception is difficult, because as a teacher you are trying to inspire all your students, considering their diverse backgrounds, knowledge, experiences and learning styles.
most people come to any course with some preconceived notions, some knowledge about the topic that you’re talking about, and you should find out what that information is. (TQ1/16)

it’s really very hard to get a classroom full of disparate people who have different backgrounds and different needs and different things that inspire them and to somehow give them an experience that partly relies on what they do and what they bring to it . . . (DL1/31)

I’m a teacher who uses a variety of discussion techniques . . . [because] different people think different ways, respond to different activities . . . . if you can find what each person likes best, that’s probably the milieu that they’re going to learn the most in, because they want to. (MD3/38-39)

Helping learners identify their own intrinsic motivations to learn is an important part of this process.

I find intrinsic motivation to learn more compelling than extrinsic motivation and I think if the teacher is the one who’s saying, ‘Well learn this for me, because I’m going to ask you on Friday and you have to tell me and then I’ll be pleased with you,’ that seems to me much less important than that somebody thinks, ‘Well I really want to find out about this; I’m fascinated by it and it matters to me, so I’m going to go and learn about it.’ So I guess I don’t want to be the kind of teacher who says, ‘Learn this for me.’ I want to be the kind of person who says, ‘Maybe you’ll want to learn this for you, because I think it’s interesting—maybe you will too.’ (DL1/9)

that would be to me a really good teaching experience, is that--to have my students walk out saying, ‘I’d like to find more about--I’d like to find out more about that.’ ‘I wonder if . . .’ That’s really what I have to give them. (MD3/59)

With some teachers, teaching from this conception involves caring about students enough to help them change their conceptions of themselves in the world.

I enjoy teaching . . . the best time I had was in the Learning Assistance Centre, and like turning on those lights for those kids, making them understand, getting them to the point where they see what it was and they could do it, and that self-satisfaction that they got from doing it, you know? It’s like going over and you’re
sort of mending part of that person, eh, because now they’re starting to see themselves differently, and helping them to realize that intelligence has nothing to do with whether or not you understand [X], and you shouldn’t equate yourself to that. (TQ1/59)

This process involves (1) helping them become self-confident learners:

... the whole idea of being scared or feeling like maybe you’re stupid or trying like hell to figure out what the right answer is. I tried really hard I think to almost make those things not happen if there’s any way I can do that, you know. Just sort of reassure them that this is a place where you can try things out, try things on . . . (KU1/15-16)

(2) helping them understand that they know things themselves, and that there are ways to express that knowledge:

I . . . help them to feel that their own opinions are valid and to figure out what they are and then express them. (DL2/46)

and (3) helping them understand that they can help/teach themselves and others--that they do not always need a teacher to teach them:

I think it’s a very interesting way to teach people, is to help them teach themselves . . . get people to start doing some more teaching on their own and learning on their own sort of thing, because they can do it. We did it . . . (TQ2/6-7)

Caring requires having high expectations for the students:

... they put a lot of emphasis in the workshop on helping, coaching, coaxing the student along, you know? And I--I do that in my own approach to what I’m doing, like I see it as really key in my--but I can also see it as important to--not to sort of, I don’t know, baby them along or something, you know? That’s--they also have to take some responsibility for it too. (KU2/16)

I am a teacher who cares about student programs and attitudes. I have had a lot of students who have told me that they can see that I care and that that’s important to them . . . caring about how well the class is doing, caring about their progress, caring about whether or not they’ve been in to see me for three weeks . . . I think
that's important too--to show that you care, otherwise how can you expect the students to care about what they do, if you don't care for them? . . . My attitude to teaching will rub off on their attitude to learning. If I go in there not prepared, if I go in and I feel like I really don't want to be there, then I think that's something that will rub off. (QD3/ )

Helping students change their conceptions of themselves also involves helping them understand that they are all to some extent different from each other, that it is all right to be different, and that they should value others' differences.

[I can] encourage the students to accept each other although they may have different opinions. [And that's important because] . . . diversity is a great thing and I think that when you run across someone who has a whole different point of view, you can't help but grow as you get to know them and you can't help but know that yours isn't the only way . . . . That depending on a person's experience, they might think another way is better for them. You know? And--their difference of opinion is not a personal affront. (QE3/48)

Successful teaching, for those who help learners change their conceptions of themselves in their worlds as a first step toward inspiring learning, occurs when

They're pulling out their own knowledge, their own ideas about stuff, and trying them out, learning that they really are something, you know? (KU2/55-56)

Overall, when the focus of teaching is understood to be inspiring learning and honouring curiosity,

A teacher's job is not to share his knowledge with you but to try to bring you to the threshold of your mind. (MD1/7)

Defining this conception again involves specific beliefs within the overall categories of beliefs from Chapter Two. The purpose of teaching is to encourage students to become excited about learning; to do this, the teacher must help them learn
how to learn. Content is important as a vehicle on which to practice learning; it is not important in and of itself.

Teachers are responsible for acting as facilitators who act as resources and use their expertise to excite and inspire the students. They are also role models who are enthusiastic about learning. Their responsibility for inspiring a diversity of learners makes teaching difficult. Thus, one of their functions is to help learners identify their own intrinsic motivations to learn. This may include helping them to change their own conceptions of themselves in the world.

Learning is something that people will do all their lives; it is part of what makes life exciting, joyous and empowering. Teaching-learning transactions involve mutual interactions among all participants; learning is a cooperative process where everyone (including the teacher) is understood to be learning together. Learners own the course; it would not exist without them.

Summary

Four qualitatively different conceptions of teaching emerged from the data in this research. I have labelled the global conceptions used to formalize my understanding of these different conceptions as: (1) Communicating Content--Sharing Concepts, (2) Contextualizing Learning--Knowledge in Action, (3) Developing Scholars--Advancing a Discipline, and (4) Inspiring Learning--Honouring Curiosity.
Discussion

This discussion examines what we can learn from these findings, and comparison of them to results from similar work discussed in the literature, with respect to the original aims of this research. The research began as an attempt to explore and identify the conceptions of teaching held by nine teaching assistants, and, in doing so, to increase our knowledge of the belief aspects of conceptions as thought structures. Thus, this discussion begins by considering the four global conceptions, collectively and individually, reviewing some of the similarities and differences found. It continues by looking at some aspects of the similarities between and among global conceptions identified by other researchers and those identified in this research. The section concludes with a review of the beliefs which have been identified, and a brief discussion of the difficulties of analysis given the lack of standardization among the global conceptions identified by various researchers.

Global Conceptions Examined Collectively

In analyzing the findings presented above, four related beliefs can be identified as common to all four conceptions of teaching. Differences among the conceptions relate to differences in how the beliefs were implemented in practice by the teaching assistants. These common beliefs and the ways in which they vary in implementation are presented and discussed below.
First, holders of all conceptions considered their learners to be participants in the teaching-learning process. Variation occurred in the extent to which they were considered participants, and/or how they were encouraged to participate. For example, those holding the Developing Scholars conception encouraged learners to articulate and question their own ideas and contributions. Those holding the Contextualizing Learning conception encouraged students to find real world applications for their own knowledge.

This common belief in learners as participants differentiates these conceptions from some of those identified by other researchers (Dall’Alba, 1991; Pratt, 1992), where the participation of learners is not considered an important element in the teaching-learning process. This difference is discussed further when that research is examined below.

Second, given that learners are participants in this process, individual diversity among learners is understood to affect learning. Differences among the conceptions were related to beliefs about how to respond to this diversity. For example, those holding the Communicating Content conception taught to the majority of students within the class, believing that it was not possible to tailor their teaching to meet the diverse needs of all. Those holding the Inspiring Learning conception, on the other hand, tried to teach to inspire each of their diverse students, despite the perceived difficulty in so doing.
Discussion of and reflection about this belief and possible differences in response to student diversity appeared to lead some TAs to question the adequacy of their conceptions of teaching, and thus to initiate the process of changing those conceptions. This process and the relevant findings are discussed further in Chapter Five.

Third, holders of all conceptions believed that teaching involved helping learners develop their interest(s) in the content. Two variations were identified. The first is in the importance accorded to specific subjects by the TAs. For example, those holding the Communicating Content conception tried to develop their learners' interest in the subject(s) they were teaching, while those holding the Inspiring Learning conception focused on getting students interested in learning—the subject was less important. A second difference exists in the underlying reasons for TAs wanting to interest students in the content—for example, those holding the Contextualizing Learning conception were concerned with the future application of learning by their students, and with helping those students understand the relationship between their subjects and the students' lives in the "real world." Some of those holding the Developing Scholars conception, on the other hand, wanted specifically to help learners become scholars in particular subjects (those of interest to the TAs) in their own right.

This belief about helping learners become interested in content is related to the first belief discussed above. If learners were not considered to be participants in the
teaching-learning process, it is unlikely that the TAs would be concerned about developing learners' interest in the content.

Finally, holders of all conceptions understand teaching to be communicating with learners. However, the goals of this communication, the methods by which it is undertaken, and the extent to which the TAs consider themselves and/or their learners responsible for it differ. For example, those holding the Communicating Content conception believe themselves primarily responsible for ensuring that communication occurs, while those holding the Inspiring Learning conception understand the responsibility to be jointly held by both teaching assistant and learners.

This belief in teaching as communicating with learners is also related to the first belief discussed above. If learners were not considered to be participants, there would not be any need to communicate--in the sense of sharing something with, holding intercourse with--with them. Dissemination of information would be considered adequate.

This analysis illustrates that the TAs participating in this research believed that there were two parties involved in the teaching-learning process--the teacher and the learners. While the relationship between teacher and learners varied based on other beliefs of the teacher and the learners, contextual constraints, etc., in all cases teaching was understood to be, as a minimum, a communication and sharing of knowledge about content, process or both.
Global Conceptions Examined Individually

Considering each conception individually, we gain interesting insights into the teaching assistants' differing understandings of teaching.

Communicating content.

TAs with the Communicating Content conception were primarily committed to their content or discipline. As teachers, they were responsible for organizing and communicating that content to their learners; thus, to teach well they had to predict the hierarchical nature of that content and how it could best be communicated to students. They perceived their credibility as based on knowing their content well, and being able to answer questions accurately. Their challenge as teachers was increasing their content competency. Accountability was relatively immediate; their effectiveness as teachers was measured by the success achieved by their students on examinations.

Contextualizing learning.

TAs with the Contextualizing Learning conception were primarily committed to helping learners develop their abilities to apply their learning in the "real world." As teachers, they were responsible for helping students understand the connections between what they were learning and the outside world; thus, to teach well they had to be able to predict or to learn the contexts from which their students came and/or to which they were going. They perceived their credibility as based on their work experience (knowledge of the outside world)
and subsequent reflection on that experience--their praxis. Their challenge as teachers was to predict "content in action," or how and for what those things which they taught--knowledge, and the mechanisms to use that knowledge--could be used by their learners in the outside world. Accountability for them as teachers was delayed, since their effectiveness was measured by students' subsequent success in the real world.

Developing scholars.

TAs with the Developing Scholars conception were primarily committed to encouraging the development of scholars. As teachers, they were responsible for helping students develop an "academic way of knowing;" thus, to teach well they had to be able to examine, question, and challenge assumptions, ideas, and understandings, both their own and those of others, and to model forms of inquiry and ways of knowing. They perceived their credibility as based on their own scholarly ability. Their challenge as teachers was to continue learning and growing as scholars themselves so that they would become better role models. Accountability was relatively immediate, since their effectiveness was measured by whether their students had ideas which they could communicate, thinking and reasoning out different arguments independently.

Inspiring learning.

Those TAs with the Inspiring Learning conception were primarily committed to their learners and to helping those learners become excited about learning. As teachers, they were responsible for helping students come to understand that they
could pursue their own curiosity in all aspects of their lives. Thus, to teach well they had to help students: (1) find their own intrinsic motivations for learning, and (2) learn how to learn. They perceived their credibility as based on their knowledge of themselves as people who loved and were excited by learning, modelling ways of thinking. Their challenge as teachers was to predict problematic content areas for individual learners, and to support them in their learning of this content. Accountability was both relatively immediate and delayed, since their effectiveness was measured by whether their students had become excited about and involved in a lifelong process of learning.

Summary.

This analysis illuminates some of the differences which exist among the beliefs forming the basis for these conceptions. Similarities and areas of overlap among all the conceptions were discussed when they were examined collectively. Areas of overlap in beliefs between one or two conceptions are discussed in Chapter Five.

Comparison with Conceptions Identified by Others

As discussed earlier in this chapter, conceptions, as "filters" through which individuals interpret their worlds, represent characteristic ways of understanding a phenomenon. Global conceptions represent researchers' attempts to characterize the conceptions held by their respondents (Beatty, Dall’Alba & Marton, 1990). Because researchers differ in how
they formalize their understandings, different global conceptions may be used by different researchers to describe the same conceptions.

Further, it can be difficult to determine whether two or more global conceptions which appear to be similar are in fact describing the same conception. Differences in context, respondents, and researcher interviewing techniques may result in a focus on some aspects of a conception in one study, while significantly different aspects are focused on in another. Thus, while similarities and differences between global conceptions can be identified when comparing and contrasting various research results, lack of information about a particular aspect of a conception does not necessarily imply that the conception in question either differs from or is equivalent to another conception. It may, instead, tell us more about the focus of the researchers involved.

I do not, in this analysis, compare and contrast the global conceptions identified here with all of the findings from previous research presented in Chapter Two. The tentative dimensions of beliefs about teaching proposed there were derived from an analysis of those findings, and will be discussed in relation to the constituent dimensions derived from this research in Chapter Five.

At this point, the discussion will focus only on the relationships between the current findings and: (1) other phenomenographically identified conceptions of teaching (Dall'Alba, 1991; Larsson, 1983, 1984; Martin & Balla, 1991;
Pratt, 1990; Pratt, 1992; Samuelowicz & Bain, 1992), and (2) those conceptions of teaching held by teaching assistants (Menges & Rando, 1989). Thus the current discussion will consider only those findings obtained by researchers using either a similar methodology or a similar population to this research.

The number of global conceptions identified by these researchers varies. Where I have identified four global conceptions in my research, Dall’Alba (1991) notes four; Larsson (1983, 1984) two; Martin and Balla (1991) identify three global conceptions, with six sub-categories; Pratt in his 1990 work lists three, and in 1992, five; and Samuelowicz and Bain (1992) identify five.

Menges and Rando (1989) examine teaching assistants’ orientations to teaching rather than their global conceptions of teaching. They identify three such orientations.

Differences also exist in the populations from which the conceptions were derived, as shown in Table 10 below. The number of individuals interviewed, their occupations, and the countries within which they live and work, vary. Thus, while there are similarities among the contexts of the respondents, there are also differences.
TABLE 10

Other Research on Conceptions

<table>
<thead>
<tr>
<th>Researcher</th>
<th>Number interviewed</th>
<th>Occupation</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dall’Alba (1990)</td>
<td>20</td>
<td>Post-sec. teachers</td>
<td>Australia</td>
</tr>
<tr>
<td>Larsson (1983, 1984)</td>
<td>29</td>
<td>Adult educators</td>
<td>Sweden</td>
</tr>
<tr>
<td>Martin &amp; Balla (1990)</td>
<td>13</td>
<td>Post-sec. teachers</td>
<td>Australia</td>
</tr>
<tr>
<td>Menges &amp; Rando (1989)</td>
<td>20</td>
<td>Teaching assistants</td>
<td>U.S.A.</td>
</tr>
<tr>
<td>Pratt (1990)</td>
<td>57</td>
<td>Adult educators</td>
<td>China</td>
</tr>
<tr>
<td>Pratt (1992)</td>
<td>250+</td>
<td>Post-sec. teachers &amp; adult educators</td>
<td>China</td>
</tr>
<tr>
<td>Samuelowicz &amp; Bain (1992)</td>
<td>13</td>
<td>Post-sec. teachers</td>
<td>Australia</td>
</tr>
</tbody>
</table>

Despite these differences, however, similarities can be identified among the conceptions characterized by these researchers, and between them and the conceptions derived from the current research. Because of the differences in how researchers formalize their understandings of the conceptions they identify, it is not possible to positively determine whether aspects of these global conceptions which are similar
are in fact describing the same conceptions. The most that can be said is that they appear to be related. However, an examination of these similarities does provide some interesting insights into the underlying beliefs of individuals holding these related conceptions. These insights are presented here through a comparison of the relevant aspects of the global conceptions proposed by other researchers with those derived from the current research. Specific aspects of the derived global conceptions are not repeated here; rather, the discussion examines the relevant aspects of other researchers' findings under the titles of the global conceptions identified in this research.

**Communicating content—sharing concepts.**

Each of the other phenomenographic researchers has identified one or more conceptions which appear to have some similarities both to each other and to aspects of the Communicating Content conception. Two of Dall'Alba's (1991) seven conceptions fall somewhat into this category: (1) "teaching as presenting information;" and (2) "teaching as transmitting information (from teacher to student)." Larsson (1983, 1984) identifies one: (1) "teaching as presenting and structuring content for learners." Martin and Balla (1991) identify one conception, which has two sub-categories: "teaching as presenting information," with either a "delivery focus" or with a "content organization focus." Pratt (1990) notes a "delivery of content--teacher as transmitter of knowledge" conception. In 1992, Pratt identifies an
"engineering--delivering content" conception. Samuelowicz and Bain (1992) note "teaching as imparting information."

In examining these global conceptions, two similar components emerge. First, teaching which is considered as imparting information or transmitting knowledge has two interrelated aspects which are repeatedly identified: (1) organizing the content in such a way that learners will understand it; and (2) presenting the content in a clear, concise and understandable manner. Some researchers, in establishing their global conceptions, separate these aspects; others note that both exist, and combine them in one global conception.

Second, students' participation in the teaching-learning process is considered in one of two ways. Either they are assumed to be present, participating only in the sense that they are "soaking up" the knowledge imparted to them, or they are seen as minimal participants in the teaching-learning interaction process.

With respect to research on teaching assistants, Menges and Rando (1989) identify a "teaching as content" orientation, which appears to be closely related to the conceptions discussed above. The focus in this orientation is on subject matter, and imparting information about the subject to students. Communication of content is the responsibility of the teaching assistant, and students participate only minimally in the process.
However the conceptions are characterized, it appears that individuals holding these related conceptions have similar beliefs. They see the primary responsibility for teaching as belonging to the teacher. A corollary to this is that the active player in the teaching-learning process is understood to be the teacher, not the learners. The focus of individuals who have this understanding of teaching is on content, and what they can do to disseminate that content to (mostly) non-problematic learners.

**Contextualizing learning--knowledge in action.**

While four global conceptions identified by others appear to be related both among themselves and to aspects of the Contextualizing Learning conception, Larsson (1983, 1984) and Pratt (1990) did not identify this conception, as far as can be established from their global conceptions. Those who did include Dall’Alba (1991), who identifies "teaching as illustrating the application of theory to practice," and "teaching as developing concepts/principles and their interrelations." Martin and Balla (1991) discuss "teaching as encouraging active learning," with either an "experiential focus" or a "vocational variation" of that focus. Pratt (1992) identifies an "apprenticeship--modelling ways of being" conception. Samuelowicz and Bain (1992) describe a "teaching as facilitating understanding conception."

In comparing these global conceptions, one similarity emerges. It is the perception held by teachers of the importance of the relationship between theory and practice--
between what students are learning now and the "real world" in which they will use that knowledge.

The perceived importance of this relationship is understood differently, depending on how the conception is characterized. Dall'Alba (1991), in one global conception, discusses the emphasis for the teacher as illustrating that theory applies in practical situations. In the other, the emphasis is on concepts and principles (theory) and how they relate in real life (practice). Martin and Balla (1991) identify the need for students to be active in the learning process, so that they can relate the topic to their own past or present experience. The active learning they discuss frequently involves learning in a practical setting, from teachers experienced in that practice. Pratt (1992) discusses learning as something which occurs within the context of practice, where learners work with teachers who are expert practitioners. These experts introduce students to "the best ideas, values, and methods of practice available" (p. 212). Samuelowicz and Bain (1992) discuss facilitating understanding in terms of learners being able to apply knowledge "not only to the new problems within the course but beyond the boundaries of the course" (p. 10). In all cases, the underlying assumption is that the relationship is important because students who understand that relationship will be better motivated to learn, through experiencing, either vicariously or literally, the "reasons why" they need to learn a particular topic.
With respect to research on teaching assistants, Menges and Rando (1989) identify a "teaching as motivation" orientation, which appears to be related to the conceptions above. The focus in this orientation is on interesting students in and involving them with the subject, so that they are engaged with a set of ideas both within and outside of the classroom.

It appears that individuals holding these related conceptions, however they may be categorized, have similar beliefs. They see helping students understand the relationship between practice and theory--between the "real world" and "school"--as the focus of teaching. While the active players in this process are both the learners and the teacher, the role of the learners is to learn, practice and accept that which is previously known to expert practitioners, not to challenge.

This conception is a good example of one where researchers differ, including aspects of it in a variety of global conceptions, as they did in those conceptions discussed under Communicating Content above. Making comparisons is difficult. For example, Martin and Balla (1991) identify another variation of their "teaching as active learning" conception, which they term "motivation focus." This is closely related to Menges and Rando's (1989) "motivation orientation," although it does not specifically incorporate the notion of motivation through understanding of the relationship between practice and theory. Yet there is clearly some overlap.
Developing scholars—advancing a discipline.

Several conceptions identified by other researchers include aspects similar to those identified in the Developing Scholars conception, and appear to be related among themselves as well. As with the Contextualizing Learning conception, however, not all researchers identified a similar global conception. Dall'Alba (1991) discusses three conceptions: (1) "teaching as developing the capacity to be expert," (2) "teaching as exploring ways of understanding from particular perspectives," and (3) "teaching as bringing about conceptual change." Larsson (1983, 1984) contributes "teaching as involving the learners in interpreting and structuring their work with the content." Martin and Balla (1991) identify "teaching as active learning," with a "discussion (of content) focus." Pratt (1992) presents a "developmental conception--cultivating the intellect," and a "nurturing conception--facilitating personal agency." Samuelowicz and Bain (1992) discuss "teaching as an activity aimed at changing students' conceptions or understanding of the world."

In comparing these global conceptions, two similarities emerge. First, the underlying focus in these conceptions can be characterized as helping learners change their ways of: (1) thinking about content--from simple to complex, becoming more like those of an expert; (2) thinking about themselves as "content handlers"--from not competent to competent; and (3) interacting with that content--from "unable" to "becoming able." There are two primary aspects to this focus. One
aspect is concerned with the intellectual development of learners; the other with the self-esteem and self-confidence of people who are also learners who "handle content." Some researchers identify one aspect in their global conceptions; some identify both. Some consider both aspects part of the same global conception; others separate them.

Second, the diversity of learners is recognized and accepted. Students are not considered alike in their beliefs, attitudes, understandings and (mis)conceptions. Rather, teachers accept that learners differ, and that those differences must be accepted and accounted for in their teaching.

Menges and Rando (1989) do not identify a specific orientation to teaching that is related to this conception. However, a combination of the content orientation--discussed above--and the process orientation--which focuses on helping students learn to think--may be applicable.

However the conceptions may be characterized, it appears that individuals holding these related conceptions have similar beliefs. They believe that teaching focuses primarily on development of the abilities of diverse learners to inquire into and think about content in particular ways. This development may entail that learners go through a process of conceptual change in their understandings of the content, themselves, or both.
Inspiring learning--honouring curiosity.

Again, not all of the other phenomenographic researchers identified conceptions with similar aspects to the Inspiring Learning conception. Those who did include Martin and Balla (1990), who identify a "relating teaching to learning" conception, and Pratt (1992), who discusses a "developmental conception--cultivating the intellect," and a "nurturing conception--facilitating personal agency." Samuelowicz and Bain (1992) discuss "teaching as supporting student learning."

In examining these global conceptions, one similarity emerges. The focus is on learning as a (student-centred) process, with the role of the teacher seen as one of encouraging, inspiring, assessing and assisting. Learning and the ability to learn are what is important.

With respect to research on teaching assistants, Menges and Rando (1989) identify a "teaching as process" orientation, which appears to be related to the conceptions above. The focus in this orientation is on helping students learn to think or process information--helping them learn how to learn.

It appears that individuals holding these related conceptions, however they may be characterized, have similar beliefs. They believe that students' desire to learn and their ability to learn is to be fostered and promoted. The subject or content is less important than ways of thinking about the process.
Two of Pratt's (1992) conceptions overlap both the Developing Scholars conception and this one, with some aspects applicable individually, and some aspects applicable to both conceptions. While it is probable that other instances of this type of overlap exist, more detailed descriptions of the global conceptions concerned would be necessary to identify them.

Additionally, relationships between some of the global conceptions identified by other researchers and the conceptions derived from this research cannot be proposed at this time. They include Pratt's (1990) "development of character--teacher as role model" and "a type of relationship--teacher as helper or guide for the learner," as well as Pratt's (1992) "social reform--seeking a better society" conception. More information about both these conceptions and the derived ones would be needed to propose relationships.

Summary

This discussion began by identifying four related beliefs common to the four global conceptions derived from this research. They include: (1) learners are participants in the teaching-learning process, (2) individual diversity among learners is understood to affect learning, (3) teaching involves helping learners develop an interest in content, and (4) teaching is communicating with learners. Differences among the conceptions with respect to these beliefs, which related to their practical implementation by the teaching assistants, were examined. This analysis illustrates that the participants in
this research believe that there are two parties in the teaching-learning process—the teacher and the learners, and that teaching is a sharing of knowledge about content, process, or both.

Differences among the derived conceptions were examined by looking at each conception individually. The conceptions were seen to differ with respect to beliefs about commitment, responsibility, understanding of how to teach well, credibility, challenge, and accountability.

The derived conceptions were compared and contrasted with findings from related phenomenographic research and from related research involving teaching assistants. While it was not possible to positively determine whether similar aspects of the global conceptions examined were in fact describing the same conceptions, relationships among some of them were identified.

Summary

This chapter has begun presenting and discussing findings from twenty-seven interviews with nine teaching assistants. A portrait of the teaching assistant respondents set the context for presentation of the findings and indicated that this group appears to be similar to those who have been examined by other researchers.

Four qualitatively different conceptions of teaching were identified. The global conceptions which characterize these
conceptions include: (1) Communicating Content--Sharing Concepts, (2) Contextualizing Learning--Knowledge in Action, (3) Developing Scholars--Advancing a Discipline, and (4) Inspiring Learning--Honouring Curiosity. Each identifiable aspect of these global conceptions was presented and illustrated with one or more representative quotations.

In the discussion, four related beliefs common to the global conceptions were identified. Differences among the conceptions with respect to these common beliefs were related to their practical implementation by the teaching assistants. The global conceptions were then considered individually, and differences among them examined. Finally, the derived conceptions were compared and contrasted with findings from related phenomenographic research and related research involving teaching assistants.

Chapter Five continues the presentation and discussion of findings, looking at common constituent dimensions of the four global conceptions.
CHAPTER FIVE

CONCEPTIONS OF TEACHING ARE . . .

. . . conceptions of teaching are dynamic; . . . evolving with experience that either confirms or challenges present thinking and beliefs.

- Daniel D. Pratt
  Conceptions of Teaching

This chapter moves beyond the global conceptions that were the focus of Chapter Four to consider the constituent dimensions of those global conceptions. The dimensions emerging from the data are defined and discussed, and then compared and contrasted with the tentative dimensions (TDs) derived from the literature. Three possible relationships among the conceptions, determined by these dimensions, are considered. Following this, changes in the conceptions held by TAs during this research are presented and discussed. The chapter closes with a brief examination of factors indicated by the findings which may influence changes in conceptions, and suggests some directions for future research.

Conceptions As Unique Profiles Of Dimensions

As discussed in Chapter Two and illustrated in Chapter Four, comparing and contrasting different researchers' ideas about the belief aspects of thought structures is difficult. Variations in terminology, differences in definition, overlap in the aspects of thought structures examined and the foci of
the research, and variations in the frameworks used to describe and/or explain the results all contribute to this difficulty. While variety has its merits, this lack of standardization also makes comparison and integration of results complex and problematic.

Following Samuelowicz and Bain (1992), I have attempted to reduce this difficulty, and thus increase the possibility of establishing correspondence between the claims of different researchers. Seven constituent dimensions were extracted from the global conceptions that emerged from the data. These dimensions are used to delimit and define the conceptions, cross-validating the internal consistency of the four global conceptions. It is important to note here that while I was analyzing the data, I was aware of the tentative dimensions (TDs) derived from the literature in Chapter Two, and these may have had some influence on the constituent dimensions which emerged.

This section of the chapter begins by defining the seven dimensions. Then, Table 11 lists the unique combinations of dimensions comprising each global conception. Next these combinations are discussed, and the section concludes with a review of the similarities and differences among the global conceptions identified.

Seven Dimensions Defined

The four global conceptions emerging from the data can be defined and delimited by seven dimensions. Each dimension is a
bi-polar continuum of beliefs, as defined below. The title of each dimension provides a useful label for discussion; the two poles of each of the continua are represented as A and B, and are coded as such in the profiles.

1. **Learner Diversity**

   A. Learners are members of a category or group who behave similarly, whose prior knowledge, skills, experience and (mis)conceptions do not affect their learning and who are not problematic for the teacher.

   B. Learners are dynamic and unique, exhibit diverse behaviours and learning styles, and have prior knowledge, skills, experience and (mis)conceptions which are important to their current learning.

2. **Learner Autonomy**

   A. The teacher is responsible for the learning and must motivate the learners and make decisions for them.

   B. The teacher and the learners are jointly responsible for the learners' learning; some learners are initially self-motivated and capable of making responsible decisions for themselves, while others become more so with assistance from the teacher.
3. **Orientation of Learning**

   A. Learning is examination oriented and a prescribed requirement.
   
   B. Learning is application oriented and personally relevant.

4. **Expected Outcomes of Learning**

   A. Learning outcomes are expressed in quantitative terms, to know more; that is, the accumulation of factual knowledge or mastery of skills, a product, or achievement.
   
   B. Learning outcomes are expressed in qualitative terms, to know differently; that is, interpret the world differently or change one's conceptual understanding, a process, or task.

5. **Knowledge and Meaning**

   A. Knowledge and meaning are: stable; external to the learner; facts which can be transmitted from one person to another; curriculum bound; provided by the teacher, the text, or implicit in the material; and teacher controlled.
B. Knowledge and meaning are changing, created and constructed by the learner, an interpretation of reality, and learner controlled.

6. **Teaching-learning Process**

A. The teaching-learning process is primarily one way transmission of knowledge, emphasizing product, with the teacher as a content expert and role model.

B. The teaching-learning process is interactive and cooperative, emphasizing process and the construction of knowledge and meaning, with the teacher as a co-learner and role model.

7. **Focus of Teaching**

A. The focus of teaching is on content, emphasizing the transmission of information and movement of learners through a pre-determined curriculum in a pre-specified time period.

B. The focus of teaching is on the learner, clarifying values, promoting intellectual growth, and/or the building of self-esteem and self-concept.
Conceptions And How They Are Related:

Profiles Of Dimensions

Similarities and differences among the four global conceptions can be described in terms of their seven constituent dimensions. The same dimensions are used to describe each global conception; thus, each conception is a unique profile within these dimensions.

The global conceptions were compared and contrasted to extract their implicit dimensions. This process resulted in the establishment of a coding system that was used to re-code a sample of the original transcripts and check consistency of the conceptions, similar to the process discussed by Samuelowicz and Bain (1992).

The coding system used by Samuelowicz and Bain (1992) allowed the coding of a respondent’s beliefs at either extreme of a bi-polar dimension (A or B) or as a blend of the two extremes (AB). While that system was useful, it did not allow for the complexities of the beliefs included in this data. Thus the coding system presented below (Table 11) provides for a further level of distinction in the dimensional profiles.

For each dimension, a teaching assistant’s expressed beliefs are coded as A, Ab, AB, aB, or B. The extremes of the dimensions are A and B. An equal blend of both is coded as AB. Unequal combinations are shown as Ab and aB. Each of the unique dimensional profiles presented and summarized in Table 11 is discussed in detail below.
TABLE 11

Dimensional Profiles

<table>
<thead>
<tr>
<th>Conceptions of teaching</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>n+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicating Content</td>
<td>Ab</td>
<td>Ab</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>Ab</td>
<td>A</td>
<td>4/4/4</td>
</tr>
<tr>
<td>Contextualizing Learning</td>
<td>B</td>
<td>Ab</td>
<td>B</td>
<td>Ab</td>
<td>AB</td>
<td>aB</td>
<td>AB</td>
<td>3/5/5</td>
</tr>
<tr>
<td>Developing Scholars</td>
<td>B</td>
<td>aB</td>
<td>aB</td>
<td>AB</td>
<td>AB</td>
<td>aB</td>
<td>aB</td>
<td>5/5/5</td>
</tr>
<tr>
<td>Inspiring Learning</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>7/8/8</td>
</tr>
</tbody>
</table>

* Dimensions

1. Learner diversity
   - A: does not affect learning
   - B: is important to learning
2. Learner autonomy
   - A: teacher responsibility
   - B: joint responsibility
3. Orientation of learning
   - A: evaluation, prescribed application, personally relevant
4. Expected outcome of learning
   - A: quantitative--know more
   - B: qualitative--know differently
5. Knowledge and meaning
   - A: stable, external to learner
   - B: changing, constructed by learner
6. Teaching-learning process
   - A: one-way transmission
   - B: two-way cooperation
7. Focus of teaching
   - A: content
   - B: learners

+ The total number of cases for each interview series (19/22/22) exceeds the number of respondents because in only two instances did respondents hold only one conception of teaching. In all other cases, respondents held either two or three conceptions of teaching.
Communicating Content: Sharing Concepts

The global conception Communicating Content can be described as a unique dimensional profile of beliefs. Learners are considered to be members of a group who behave somewhat similarly, and who are not problematic because they are treated similarly by the teacher. If learners have prior knowledge, skills, experience, and (mis)conceptions which cause problems for them in their learning, it is ultimately their responsibility to resolve these problems. The teacher assists where s/he can, but it is not possible to deal with each student's prior knowledge, skills, experience, and (mis)conceptions individually. Rather, teachers teach to the majority (Dimension 1, coded Ab).

Teaching assistants with this conception of teaching believe that the teacher is primarily responsible for the students' learning, and must motivate the learners and make most decisions for them. Thus they expend considerable effort in developing different procedures for presentation of content, some of which, they believe, must motivate the learners. At the same time, learners are expected to make an effort, come to class, and seek out the teacher for help if needed (Dimension 2, coded Ab).

Learning is considered to be evaluation oriented, a prescribed requirement. Preparing learners for examinations is one of the goals of those who teach from this conception (Dimension 3, coded A).
Teaching assistants with this conception of teaching understand the expected outcome of learning to be quantitative, that is their learners will have accumulated factual knowledge or mastered specific skills; they will know more content (Dimension 4, coded A). They believe that knowledge is stable and external to the learner; that it is provided by the teacher, the text, or implicit in the material (Dimension 5, coded A).

They see the teaching learning process primarily as one-way transmission of knowledge, from the teacher as content expert to the learners. At the same time, the process involves some two-way interaction; learners ask questions about content, and make suggestions about ways in which they, as teaching assistants, might better communicate that content (Dimension 6, coded Ab).

The focus of teaching is on content--on the transmission of information, and movement among learners through a pre-determined curriculum in a pre-specified time period (Dimension 7, coded A).

Contextualizing Learning: Knowledge in Action

The unique dimensional profile which makes up this global conception--Contextualizing Learning--can be described as follows. Learners are considered to be unique and dynamic, with diverse behaviours and learning styles. Their prior knowledge, skills, experience, and (mis)conceptions are as important to their current learning, with its focus on
application beyond the classroom, as their learning today will be to their ability to apply that learning in the future (Dimension 1, coded B).

Teachers believe themselves to be primarily responsible for the motivation of students and the learning which occurs. This is illustrated by the importance attributed to helping students see the relevance of learning to their future lives. While some students may make such connections with minimal assistance from the teacher, most need significant direction and guidance in seeing this relevance (Dimension 2, coded Ab).

For teaching assistants with this conception of teaching, learning is application oriented and personally relevant. What matters is how the students will use the learning in the rest of their lives (Dimension 3, coded B).

Learning outcomes are primarily expressed in quantitative terms, as the accumulation of factual knowledge or mastery of skills. Where learning outcomes are considered in qualitative terms, they involve learners changing their understanding of how that knowledge or those skills can be applied in their 'real worlds' (Dimension 4, coded Ab).

Teaching assistants with this conception understand knowledge and meaning to be twofold. Knowledge and meaning is provided by the teacher, the text, or implicit in the material, as well as being created and constructed by the learners as interpretations of their reality--how they will apply it in their lives (Dimension 5, coded AB).
The teaching-learning process is understood to be essentially interactive and cooperative, emphasizing process and the construction of knowledge and meaning by the learners. While there is some one-way transmission of knowledge, what is most important is what the learners do with that knowledge in relation to their "real worlds" (Dimension 6, coded Ab).

Teaching focuses equally on both learners and content. While information is transmitted, learners are also helped to make that information personally applicable and relevant through clarification of values, the building of self-confidence, and/or intellectual growth (Dimension 7, coded AB).

Developing Scholars: Advancing a Discipline

The Developing Scholars conception has yet another dimensional profile. Teaching assistants with this conception see learners as both dynamic and individually unique, exhibiting diverse behaviours and learning styles. Their prior knowledge, skills, experience, and (mis)conceptions are believed to be important to their current learning, since scholars contribute to knowledge by building, in different ways, on what has been created previously (Dimension 1, coded B).

Those who hold this conception primarily view students' success in learning as a joint responsibility of teacher and learners. At the same time, there are situations where the teacher is responsible for helping students see the personal relevance of their learning (Dimension 2, coded aB).
Because the focus of this conception is on helping learners develop as scholars, learning is seen as application oriented and personally relevant. However, there is also a need for students to learn previously accepted knowledge within the discipline. Consequently, there is some focus on learning as a prescribed requirement (Dimension 3, coded aB).

Expected outcomes of learning are expressed quantitatively and qualitatively. Learning outcomes may be the accumulation of factual disciplinary knowledge or the mastery of academic skills. Equally, they may consist of a change in a learner's conceptual understanding or way of interpreting the world which moves the learner toward the goal of becoming a scholar (Dimension 4, coded AB).

Knowledge and meaning are understood to be both stable and external to the learner, as well as changing and constructed by the learner. That knowledge and meaning which has been previously created and accepted by scholars within the discipline may be provided by the teacher, the text, or implicit within the material. Yet scholars also contribute to the creation of knowledge. Thus knowledge and meaning are also seen as changing, constructed by the learner, and interpretations of reality (Dimension 5, coded AB).

The teaching-learning process is viewed as an interactive, cooperative, and creative process, in which the teacher is a co-learner and a role model. However, some transmission of previously created and accepted knowledge is necessary (Dimension 6, coded aB).
The focus of teaching is on the learners—helping them grow intellectually, and clarify their values, in their development as scholars. At the same time, there is some concern with content and the transmission of previously accepted and created disciplinary knowledge to future scholars (Dimension 7, coded aB).

**Inspiring Learning: Honouring Curiosity**

The dimensional profile of the global conception Inspiring Learning differs yet again. Teaching assistants who hold this conception of teaching see learners as dynamic and individually unique, exhibiting diverse behaviours and learning styles. Their prior knowledge, skills, experience, and (mis)conceptions are believed to be important to their learning, and must be incorporated into the teaching-learning process (Dimension 1, coded B).

Learning is understood to be a joint responsibility of teacher and learners. Some learners are seen as initially self-motivated, while others can develop with teacher assistance. One of the goals of those who hold this conception is to help students learn how to learn (Dimension 2, coded B).

Learning is seen as personally relevant—something from which students will benefit throughout their lives (Dimension 3, coded B). Learning outcomes are expressed in qualitative terms. The outcome of learning is learners who have different conceptual understandings or who interpret the world in
different ways; learners who know differently (Dimension 4, coded B).

Knowledge and meaning are believed to be changing, not stable. They are interpretations of reality, created and constructed by learners. Thus learning may differ from person to person (Dimension 5, coded B).

Teaching assistants with this conception understand the teaching-learning process to be interactive and cooperative, emphasizing process and the construction of meaning. The teacher is a co-learner and a role model for the students (Dimension 6, coded B).

The focus of teaching is on the learner; teaching is aimed at promoting learners' intellectual growth, helping them clarify their values, and building their self-esteem and self-confidence (Dimension 7, coded B).

Summary

Seven constituent bi-polar dimensions describe the four global conceptions. The same dimensions are used to describe all of the conceptions. Within each conception, some dimensions are held in common with other conceptions, and some differ. Thus what defines and delimits the qualitatively different conceptions are the unique profiles of the dimensions. The specific combinations of dimensions and their characteristics with respect to each conception were discussed in detail. These combinations are summarized, in a different format, in Table 12 below.
TABLE 12
Dimensional Profiles - A Second Look

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Conceptions of Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CC</td>
</tr>
<tr>
<td>Learner diversity</td>
<td>Ab</td>
</tr>
<tr>
<td>A - does not affect learning</td>
<td></td>
</tr>
<tr>
<td>B - is important to learning</td>
<td></td>
</tr>
<tr>
<td>Learner autonomy</td>
<td>Ab</td>
</tr>
<tr>
<td>A - teacher responsibility</td>
<td></td>
</tr>
<tr>
<td>B - joint responsibility</td>
<td></td>
</tr>
<tr>
<td>Orientation of learning</td>
<td>A</td>
</tr>
<tr>
<td>A - evaluation, prescribed</td>
<td></td>
</tr>
<tr>
<td>B - application, personally</td>
<td></td>
</tr>
<tr>
<td>relevant</td>
<td></td>
</tr>
<tr>
<td>Expected outcomes of learning</td>
<td>A</td>
</tr>
<tr>
<td>A - quantitative, know more</td>
<td></td>
</tr>
<tr>
<td>B - qualitative, know differently</td>
<td></td>
</tr>
<tr>
<td>Knowledge and meaning</td>
<td>A</td>
</tr>
<tr>
<td>A - stable, external to learner</td>
<td></td>
</tr>
<tr>
<td>B - changing, constructed by learner</td>
<td></td>
</tr>
<tr>
<td>Teaching-learning process</td>
<td>Ab</td>
</tr>
<tr>
<td>A - one-way transmission</td>
<td></td>
</tr>
<tr>
<td>B - two-way cooperation</td>
<td></td>
</tr>
<tr>
<td>Focus of teaching</td>
<td>A</td>
</tr>
<tr>
<td>A - content</td>
<td></td>
</tr>
<tr>
<td>B - learners</td>
<td></td>
</tr>
</tbody>
</table>

* CC = Communicating Content  
  CL = Contextualizing Learning  
  DS = Developing Scholars  
  IL = Inspiring Learning
Chapter Two concluded with a framework of nineteen tentative dimensions (TDs) of beliefs about teaching derived from a review of the literature. These dimensions were classified into five groups drawn from the elements of teaching (Pratt, 1992) and the aims and elements of education (Zahorik, 1977): (1) learners (their characteristics and the learning process), (2) subject matter or content (that which is to be learned), (3) teachers (responsibilities, functions and the teaching-learning transaction), (4) aims or ideals (goals or purposes of teaching and/or education), and (5) context (situational factors external to the teacher and the learners which influence teaching and/or learning). Neither the groups themselves nor the TDs identified in each group were prioritized.

Comparison of the seven constituent dimensions extracted from the data with the TDs derived from the literature yields several interesting insights. Table 13 shows the number of TDs and constituent dimensions within each group of beliefs, and illustrates the relationship between some TDs and their equivalent constituent dimensions. It also indicates the number of TDs which are not directly equivalent to a constituent dimension. These remaining TDs are further discussed below.
TABLE 13

Tentative Dimensions (TDs) & Constituent Dimensions

<table>
<thead>
<tr>
<th>Groupings of Beliefs</th>
<th>Tentative Dimensions from the Literature</th>
<th>Directly Equivalent Constituent Dimensions</th>
<th>Remaining Tentative Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learners</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Subject matter/ content</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Teachers &amp; teaching</td>
<td>6</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Aims &amp; ideals</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Context</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>7</td>
<td>12</td>
</tr>
</tbody>
</table>

It is possible that the twelve TDs not equated with a constituent dimension do not appear in the conceptions of this group of respondents. At the same time, what appear to be differences in dimensions may simply be differences in how those dimensions are characterized by various researchers. However, the goal is to be able to use standard constituent dimensions as a tool for comparing global conceptions. For this to work, a group of common constituent dimensions must be established. Consequently, close examination of what appear to be differences in TDs is necessary. I next look at each of the TDs, in the groups of beliefs within which they are presented in Table 13.
Learners, The Learning Process, and Learning Outcomes

Examination of previous research led to identification of six TDs within the group of beliefs about learners, the learning process, and learning outcomes. Four of the seven constituent dimensions emerging from the data are also located within this group. They are equivalent to four of the TDs: the Learner Diversity, Learner Autonomy, Orientation of Learning, and Expected Outcomes of Learning dimensions.

Two of the TDs do not appear to emerge from the present data. However, closer examination indicates similarities between those two dimensions and the research findings.

Learners' Roles

Aspects of the first TD related to learners' roles (passively receiving knowledge vs actively interpreting meanings), can be identified in both the Learner Autonomy and the Learning Outcomes dimensions. With respect to the Learner Autonomy dimension, learners who are jointly responsible for their learning are actively involved in interpreting meanings. Where teachers believe that they are responsible for the learning that occurs, the students' role can be seen as more passively receiving knowledge.

When considering Learning Outcomes, passively receiving knowledge may be seen as a quantitative outcome--the accumulation of factual knowledge. Actively interpreting meanings, on the other hand, may be considered a qualitative outcome--interpreting the world differently.
Characteristics of Learning

Similarly, aspects of the second TD, concerned with learning (fragmented and unrelated vs holistic and integrated), can be identified in the Orientation of Learning and Learning Outcomes dimensions. Learning that is examination oriented and a prescribed requirement may be considered fragmented and unrelated by some. Learning that is holistic and integrated, on the other hand, can be considered application oriented and personally relevant.

Fragmented and unrelated learning may also be considered by some to be learning which is expressed, as an outcome, in quantitative terms—the accumulation of factual knowledge, aspects of which may or may not be inter-related. Holistic and integrated learning, on the other hand, can be considered to be learning which results in learners' interpreting the world differently, since to interpret the world presumably learners must have some type of holistic view of that world.

Despite these relationships, some aspects of this TD are not incorporated in the constituent dimensions. For example, teaching which involves ensuring that students have learnt content well enough that they will not endanger others (medicine, public safety, etc.) may be examination oriented and a prescribed requirement, yet be considered also as holistic and integrated.

In sum, four of the six TDs related to learning and identified from the literature are equivalent to the four
constituent dimensions emerging from the data. Aspects of the remaining two TDs are incorporated within those four constituent dimensions. Other aspects are not. As separate dimensions, these TDs were not distinct enough in the data to warrant a separate constituent dimension.

Subject Matter/Content: What is to be Learned?

Three TDs within this group were identified from the literature. One of the seven dimensions emerging from the data is located here—the Knowledge and Meaning dimension. As before, closer examination of the two TDs which did not emerge from the research indicates similarities between them and the Knowledge and Meaning dimension.

Product/process

Aspects of the TD concerned with knowledge and meaning (from a product which is certain and to be accepted to a process which is problematic and to be questioned) can be identified in the Knowledge and Meaning dimension. Facts which are stable and can be transmitted from one person to another can be considered a product. Knowledge and meaning which is changing, created and constructed by the learners can be considered a process.

Cultural Viewpoints

Similarly, aspects of the TD concerned with the presentation of knowledge and meaning (from either one or
several cultural viewpoints) can also be identified in the Knowledge and Meaning dimension. Knowledge and meaning which are stable, curriculum bound, and consist of facts which can be transmitted from one person to another can be thought of as presented from one cultural viewpoint. Conversely, presenting knowledge and meaning from several cultural viewpoints can be expected to lead to an understanding of knowledge and meaning as problematic and to be questioned.

In sum, the Knowledge and Meaning dimension emerging from this research is equivalent to one of the TDs identified from the literature, and incorporates aspects of the remaining two.

Teachers and Teaching: Responsibilities, Functions and the Teaching-Learning Transaction

Six TDs in this group were identified from the work of previous researchers. One of the seven constituent dimensions emerging from this research is located in this group—the Teaching-Learning Process dimension. Closer examination of the remaining five TDs indicates similarities with several constituent dimensions located in various groups. Given that the focus of this group of beliefs is the process of teaching and learning, the elements of which include teachers, learners, content and context, this variety is not surprising. Thus, aspects of these TDs can be identified in the Teaching-Learning Process dimension, the Knowledge and Meaning dimension, and the Learner Diversity and Learner Autonomy dimensions. Further,
aspects of one TD relate to the context group of beliefs, from which no constituent dimensions emerged.

**Possession of Relevant Knowledge**

Aspects of the TD dealing with beliefs regarding who possesses knowledge relevant to learning (teachers or teachers and learners) can be identified in both the Learner Diversity and the Knowledge and Meaning dimensions. The two extremes of belief concerning whether or not learners possess knowledge relevant to learning, as expressed in this dimension, are expressed similarly in the Learner Diversity dimension. In the Knowledge and Meaning dimension, one pole considers knowledge and meaning as external to the learner, while the other considers it to be constructed by the learner. Again, aspects of similarity exist.

**Who Directs the Learning Process**

With respect to the TD concerned with who directs the learning process (the teacher or the teacher and the learners), the Learner Autonomy dimension deals with this issue as well. Making decisions for learners, as a teacher, implies that the teacher is directing the learning process. Teaching as facilitation, on the other hand, is concerned with shared responsibility for decision-making related to the learning process.
Learner or Teacher Centredness

The TD concerned with the teaching-learning transaction (as learner- or teacher-centred) has similarities to both the Learner Autonomy and the Teaching-Learning Process dimensions. With respect to the Learner Autonomy dimension, situations where the teacher is responsible for the learning can be considered teacher-centred; those where responsibility is shared by learners and teacher can be considered learner-centred. With respect to the Teaching-Learning Process dimension, where the process is primarily one-way transmission of knowledge, it can be said to be teacher-centred, with the teacher as content expert. Where the process is conceived of as interactive and cooperative, emphasizing process, and the teacher is considered to be a co-learner, the process can be said to be learner-centred.

Teacher-Learner Relationships

Similarly, aspects of the TD concerned with teacher-learner relationships (as distant or personal) can be identified in both the Learner Autonomy and the Teaching-Learning Process dimensions. In the Learner Autonomy dimension, situations where teacher and learners work together may be more likely to lead to personal relationships, whereas situations where the teacher is responsible for the learning may create more distant relationships.

With respect to the Teaching-Learning Process dimension, where the process is primarily one-way transmission of
knowledge, the relationship between teacher and learners may be distant. Where the process is conceived of as interactive and cooperative, emphasizing process, and the teacher is considered to be a co-learner, the relationship may be more personal.

However, other aspects of this TD are not dealt with by the constituent dimensions. For example, in situations where the process is primarily one-way transmission of knowledge, the relationship between teacher and learner may also be personal. Further investigation into the aspects of this TD are needed.

Creation of a Climate for Learning

The final TD in this group focuses on beliefs concerning the creation of a favourable climate for learning in the teaching-learning process. Similarities exist between this dimension and the Learner Diversity dimension. If learners are believed to be dynamic and unique, they will be understood to experience learning climates and be motivated within those climates differently. Where learners are considered to be members of a group who behave similarly, and whose experiences and conceptions do not affect their learning, differences in learning climates will not be considered to affect them.

However, other aspects of this TD are not incorporated in the constituent dimensions. For example, the climate for learning also influences the relationship between teacher and learners. It is related to learners' roles, etc.
In sum, the Teaching-Learning Process dimension emerging from this research is equivalent to one of the TDs identified from the literature in this category, and incorporates aspects of the remaining five. The Learner Diversity, Learner Autonomy and Knowledge and Meaning constituent dimensions include other aspects of these five TDs. However, some aspects are not accounted for by any of the constituent dimensions. Further research in this area is needed.

Aims and Ideals: Goals and Purposes of Teaching

Two TDs were identified from the literature in this group. One of the seven constituent dimensions is located here—the Focus of Teaching dimension. Close examination of the remaining TD indicates similarities with both the Knowledge and Meaning and the Focus of Teaching dimensions.

Accepting or Questioning Values

This TD is concerned with the aim of teaching (varying between instilling the accepted values of a discipline, profession, or society, and empowering learners by encouraging them to question those existing values). This relates to the Knowledge and Meaning dimension, since learners who are creating and constructing knowledge and meaning are, in the process, questioning existing meaning. Conversely, acceptance of transmitted knowledge and meaning implies acceptance of that knowledge and its meaning.
With respect to the Focus of Teaching dimension, where the focus is on learners, clarification of their values can be considered to include the questioning of values to make them more clearly understood. Where the focus is on transmission of information (and movement through pre-determined content in a pre-specified time period), acceptance of the values implicit in that content can be considered to be a pre-requisite to meeting those requirements.

In sum, the Focus of Teaching dimension is equivalent to one of the two TDs identified from the literature in this group, and incorporates aspects of the remaining one. The Knowledge and Meaning dimension also incorporates aspects of the remaining TD.

**Context: External Factors Influencing the Teaching-Learning Process**

Two TDs from this group were identified from the literature. They were: (1) the teaching-learning transaction is context-specific vs the teaching-learning transaction is similar across contexts; and (2) resources are allocated equally to all learners vs resources are not allocated equally to all learners. However, no related constituent dimensions emerged from the research.

At least three possible explanations can be found for the lack of constituent dimensions in this group. First, it is possible that one or both of these TDs exist without variation
within all of the global conceptions. It has been shown that when there is no variation in a particular aspect among conceptions, that aspect may not be focused on by the researcher (Marton, 1988b). It is conceivable that a belief forming a constituent dimension of several conceptions, and expressed identically in them all, may be neither articulated nor identified, because it is taken for granted by the participants, the researcher, or both.

Second, while two of the nine participants came from the same department, each of the others was associated with a different department and/or faculty. Also, their backgrounds and undergraduate degrees varied widely. Thus, although they were all TAs at the University of British Columbia, their specific contexts, in terms of disciplines and departments, varied. Further, while two of them had had some previous teaching experience, it was minimal. Their lack of experience in and/or knowledge of teaching in different contexts may have limited their expression of opinions concerning the influence of context on teaching-learning transactions.

Third, with respect to the dimension focusing on resource allocation among learners, there is another possible explanation, related to the fact that the participants were TAs. Despite the varying contexts within which they taught, as TAs they had no control over the resources with which they were provided. Consequently, resource allocation may have simply been taken for granted.
The fact that relevant constituent dimensions in all groups of beliefs did not emerge from the research is consistent with other researchers' results, in that no single study has yielded beliefs about teaching which could be situated in all five groups. Additional research is necessary to determine whether this consistency in results across the research is related to the backgrounds or numbers of teachers interviewed, the backgrounds or foci of the researchers, the contexts within which the teachers taught, or other factors.

Summary and Conclusions

This section compared the nineteen TDs derived from the literature reviewed in Chapter Two with the seven constituent dimensions emerging from the research. I have argued that some aspects of the twelve TDS, not specifically equivalent to the seven constituent dimensions, can be identified within one or more of those seven dimensions. At the same time, aspects of these TDs have been identified which are not accounted for by the constituent dimensions.

The number of potential common dimensions which could have been used to define the four global conceptions identified in this research has been reduced from nineteen. However, further investigation is necessary to determine what the number may be. Seven constituent dimensions were derived from the data, and can be considered actual, not potential dimensions. The remaining number of potentially relevant dimensions includes the two TDs from the 'context' category, and aspects
of the learning (fragmented or holistic) TD, the teacher-learner relationships (distant or personal) TD, and the creation of a favourable climate for learning TD.

Relationships Among Conceptions

Within the literature, different researchers postulate different types of overall relationships among the conceptions each has identified. For example, both Fox (1983) and Pratt (1992) explicitly state that all of the conceptions of teaching they have identified are valuable in different contexts, and that each is equally valid. Pratt (1992) argues that each conception has "philosophical and epistemological roots which are consonant with particular people, purposes, and contexts" (p. 218), and that exemplary teachers may be found who hold each of the conceptions identified.

Other researchers see the conceptions which they have identified as hierarchical (Dall'Alba, 1991; Martin & Balla, 1991). They understand each higher level conception to encompass all of the characteristics of the lower conceptions, while adding additional characteristics. Thus, conceptions of teaching are believed to be related to the "development" of a teacher, and by implication, there is some highest level of development toward which a teacher may strive. However, other researchers disagree, as discussed below. More investigation in this area is required.
Samuelowicz and Bain (1992) themselves understand conceptions to be ordered, as does Fox (1983), despite differences in the ordering principles used. Fox (1983) groups his conceptions into "simple" and "developed" categories based on the dichotomous views of learners held by teachers. Samuelowicz and Bain (1992) understand conceptions to be composed of continua of dimensions of beliefs. Some poles of the continua are considered of a higher order than their opposite poles. Samuelowicz and Bain (1992) specifically consider conceptions with a predominance of dimensions related to "student-centred teaching" to be of a higher order than conceptions with a predominance of dimensions related to "teacher-centred teaching." Fox (1983) refutes the assumption that when conceptions are ordered, "higher order" conceptions are better or more advanced than those "lower" in the ordering system. Samuelowicz and Bain (1992) explicitly accept it.

The reasons for choosing different ordering principles appear to be related primarily to preferences of the researchers as to the kind of teaching and learning they believe should be valued. As justification for such choices, this is questionable. It is conceivable that if conceptions are ordered, the ordering may be defined by other beliefs than those chosen by researchers, or by other factors entirely.

In this study, seven common constituent dimensions form the basis for the relationships among the global conceptions. Each global conception can be defined by a unique profile among these dimensions. The conceptions are clearly not
hierarchical; they neither contain all of the characteristics of any of the others, nor add more. Various ordering principles could be proposed, yet it is difficult to justify any such principles on the basis of the existing data. Perhaps the conceptions are applicable in different contexts, and equally valid, as postulated by Pratt (1992) and Fox (1983). However, if this is the case, it must be established through further research with a larger population.

Snapshots In Time: Tracing Changes in Conceptions

One of the objectives of this research, as discussed in Chapter 3, was to examine the conceptions of teaching held by teaching assistants and whether, and if so how, they change over time. No attempt was made to determine causality; rather, the objective was to discover the conceptions, and identify changes in them over time. Any suggestions of causality which emerged would be just that—possibilities for future researchers to investigate.

Three interviews were held with each of the respondents, at different times. The first interviews took place during the week immediately prior to the TAs participating in two Teaching Assistant Training courses. The second interviews were conducted during the week immediately after the courses. The final interviews were conducted from four to eight weeks later.
In the original research design, the third set of interviews was to take place after the teaching assistants had had an opportunity to return to their own teaching contexts. This would have allowed them time to implement their learning from the training programs, and to reflect on their understandings of teaching and how those understandings might have changed following this experience. Unfortunately, during this time three union locals at the University went on strike. Thus, some of these TAs taught only one or two weeks during this period and others did not teach at all. How the TAs' conceptions might have changed had they had the opportunity to teach and reflect on that teaching is unknown.

The next section of this chapter presents the "snapshots of conceptions" held by this group of nine TAs at the time of each series of interviews. Following this, the changes in their conceptions during the research are examined.

First Interview Series
All four global conceptions were identified during the first series of interviews. Conceptions were held by individual TAs as illustrated in Table 14, which divides the TAs into groups on the basis of the combinations of conceptions they held. Thus, Group 1 consists of two TAs who held three conceptions: Communicating Content (CC), Contextualizing Learning (CL), and Inspiring Learning (IL). One TA, holding a different combination of three conceptions--Contextualizing Learning, Developing Scholars (DS), and Inspiring Learning--
forms Group 2. Group 3 consists of four TAs who held both the Developing Scholars and the Inspiring Learning conceptions. Finally, Group 4 includes two TAs who held only one conception—Communicating Content.

TABLE 14

First Interviews

<table>
<thead>
<tr>
<th>Group(a)</th>
<th>TA, Department, Year of Students</th>
<th>Conceptions(b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>1</td>
<td>QD (Math 2)</td>
<td>CC CL IL</td>
</tr>
<tr>
<td></td>
<td>TQ (Law 2 &amp; 3)</td>
<td>CC CL IL</td>
</tr>
<tr>
<td>2</td>
<td>QE (Women’s Studies 2)</td>
<td>CL DS IL</td>
</tr>
<tr>
<td>3</td>
<td>DL (Theatre 1)</td>
<td>DS IL</td>
</tr>
<tr>
<td></td>
<td>MD (Geography 2)</td>
<td>DS IL</td>
</tr>
<tr>
<td></td>
<td>KC (Theatre 1)</td>
<td>DS IL</td>
</tr>
<tr>
<td></td>
<td>KU (Sociology 2)</td>
<td>DS IL</td>
</tr>
<tr>
<td>4</td>
<td>TO (Chemistry 1)</td>
<td>CC</td>
</tr>
<tr>
<td></td>
<td>ZZ (Food Sciences 4)</td>
<td>4 3 5 7</td>
</tr>
</tbody>
</table>

(a) The TAs were divided into groups on the basis of the combinations of conceptions they held.

(b) CC = Communicating Content  
CL = Contextualizing Learning  
DS = Developing Scholars  
IL = Inspiring Learning

Few, if any, discernible patterns can be identified with respect to relationships between the characteristics of the TAs and the contexts within which they teach, and the conceptions
they hold. The data are too limited, and identification of such patterns was not the focus of the research. However, it is intriguing to note that those individuals holding the Communicating Content conception teach either in the sciences or in law, and that TQ, who teaches law, previously taught math. Further, all of the TAs who hold the Developing Scholars conception teach in either the humanities or social sciences.

The conceptions held by each TA at this interview are considered their baseline conceptions for the purpose of this research. Changes in conceptions identified at the second and third interviews are discussed in comparison to this baseline.

Second Interview Series

Again, all four conceptions were identified during this series of interviews (Table 15). However, there were two changes from the first interviews. First the combinations of conceptions held, and thus the number of groups, changed. Second, because of the first change, some TAs were now located in different groups. As before, the groups were established on the basis of the combinations of conceptions which the TAs held.

Group 1 remained the same, with two TAs holding three conceptions: Communicating Content (CC), Contextualizing Learning (CL), and Inspiring Learning (IL). Group 2 was now composed of two TAs, again holding a combination of three conceptions different from those held by Group 1: Contextualizing Learning, Developing Scholars (DS), and
Inspiring Learning. Group 3 was now composed of three TAs who held both the Developing Scholars and the Inspiring Learning conceptions. Group 4 had divided, becoming Groups 4 and 5, with one TA in each. One held a Communicating Content and Contextualizing Learning combination; the other Communicating Content and Inspiring Learning.

TABLE 15
Second Interviews

<table>
<thead>
<tr>
<th>Group(a)</th>
<th>TA, Department, Year of Students</th>
<th>Conceptions(b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>QD (Math 2)</td>
<td>CC CL IL</td>
</tr>
<tr>
<td></td>
<td>TQ (Law 2 &amp; 3)</td>
<td>CC CL IL</td>
</tr>
<tr>
<td>2</td>
<td>QE (Women’s Studies 2)</td>
<td>CL DS IL</td>
</tr>
<tr>
<td></td>
<td>KU (Sociology 2)</td>
<td>CL* DS IL</td>
</tr>
<tr>
<td>3</td>
<td>DL (Theatre 1)</td>
<td>DS IL</td>
</tr>
<tr>
<td></td>
<td>MD (Geography 2)</td>
<td>DS IL</td>
</tr>
<tr>
<td></td>
<td>KC (Theatre 1)</td>
<td>DS IL</td>
</tr>
<tr>
<td>4</td>
<td>TO (Chemistry 1)</td>
<td>CC IL*</td>
</tr>
<tr>
<td>5</td>
<td>ZZ (Food Sciences 4)</td>
<td>CC CL*</td>
</tr>
</tbody>
</table>

(a) The TAs were divided into groups on the basis of the combinations of conceptions they held.

(b) CC = Communicating Content
CL = Contextualizing Learning
DS = Developing Scholars
IL = Inspiring Learning

* Additional conception not identified in first interview.
Additional conceptions to those they held in the first interview were identified for some TAs. KU expressed beliefs consistent with the Contextualizing Learning conception. Second conceptions were identified for each of the two TAs originally holding only one conception. For TO, the additional conception was Inspiring Learning. For ZZ, the additional conception was Contextualizing Learning.

Those with a background in teaching sciences continued to hold the Communicating Content conception. Those holding the Developing Scholars conception continued to be those teaching in either the humanities or the social sciences.

**Third Interview Series**

All four conceptions were once more identified in the third interviews (Table 16), although the number of TAs within each group and the combinations of conceptions held had changed yet again. As before, the groups were established on the basis of the combinations of conceptions held by the TAs. Three TAs holding three conceptions now formed Group 1: Communicating Content (CC), Contextualizing Learning (CL), and Inspiring Learning (IL). Group 2 was again composed of one TA, as had been the case after the first interview: Contextualizing Learning, Developing Scholars (DS), and Inspiring Learning. Group 3 also appeared composed as it had following the first interview, and consisted of four TAs who held both the Developing Scholars conception and the Inspiring Learning conception. Group 4 included one TA who held two
conceptions: Communicating Content and Contextualizing Learning. Group 5 no longer existed, because the TA who had been located in that group was now part of Group 1.

**TABLE 16**
Third Interviews

<table>
<thead>
<tr>
<th>Group(a)</th>
<th>TA, Department, Year of Students</th>
<th>Conceptions(b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>QD (Math 2)</td>
<td>CC CL IL</td>
</tr>
<tr>
<td></td>
<td>TQ (Law 2 &amp; 3)</td>
<td>CC CL IL</td>
</tr>
<tr>
<td></td>
<td>TO (Chemistry 1)</td>
<td>CC CL IL*</td>
</tr>
<tr>
<td>2</td>
<td>QE (Women's Studies 2)</td>
<td>CL DS IL</td>
</tr>
<tr>
<td>3</td>
<td>DL (Theatre 1)</td>
<td>DS IL</td>
</tr>
<tr>
<td></td>
<td>MD (Geography 2)</td>
<td>DS IL</td>
</tr>
<tr>
<td></td>
<td>KC (Theatre 1)</td>
<td>DS IL</td>
</tr>
<tr>
<td></td>
<td>KU (Sociology 2)</td>
<td>&lt;CL&gt;+ DS IL</td>
</tr>
<tr>
<td>4</td>
<td>ZZ (Food Sciences 4)</td>
<td>CC CL*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td>5</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

(a) The TAs were divided into groups on the basis of the combinations of conceptions they held.

(b) CC = Communicating Content  
    CL = Contextualizing Learning  
    DS = Developing Scholars  
    IL = Inspiring Learning

* Additional conception not identified in first interview.

^ Additional conception not identified in second interview.

+ Conception found in second interview, but not in third interview.
Again, some changes had occurred. TO was identified as expressing beliefs consistent with yet another additional conception—Contextualizing Learning. Thus, at the end of the series of interviews, TO was identified as holding three conceptions. No other TAs were identified as changing their combinations of conceptions to that extent.

The Contextualizing Learning conception identified as an additional conception held by KU in the second interview could not be identified in the third one.

Communicating Content remained among the combinations of conceptions held by all individuals who had a background in teaching sciences. Similarly, Developing Scholars remained among the combinations of conceptions held by those teaching in the humanities and the social sciences.

**All Three Interviews**

Overall, the TAs interviewed can be divided into two categories. The first category consists of six TAs who held the same conceptions throughout the series of interviews (Table 17). This lack of change in conceptions over time is compatible with findings from Martin and Balla (1991).

Within this category, there are three groups: Group 1, which includes two TAs holding Communicating Content, Contextualizing Learning and Inspiring Learning; Group 2 which includes one TA holding Contextualizing Learning, Developing Scholars and Inspiring Learning; and Group 3 which includes three TAs holding Developing Scholars and Inspiring Learning.
The individuals in this category taught in math, law, women's studies, theatre and geography; that is, they taught in sciences, social sciences and the humanities.

**TABLE 17**
No Changes in Conceptions During Three Interviews

<table>
<thead>
<tr>
<th>Group*</th>
<th>TA, Department, Year of Students</th>
<th>No. of Conceptions Held by Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>QD (Math 2)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>TQ (Law 2 &amp; 3)</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>QE (Women's Studies 2)</td>
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<tr>
<td>3</td>
<td>DL (Theatre 1)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MD (Geography 2)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>KC (Theatre 1)</td>
<td>2</td>
</tr>
</tbody>
</table>

* The groups were established on the basis of the combinations of conceptions held by the TAs.

Table 18 shows the changes in conceptions among the remaining three TAs, which were identified over the course of the three interviews. As before, the groups were established on the basis of the combinations of conceptions held by the TAs. In Group 1, KU held two conceptions (Developing Scholars and Inspiring Learning) at the first interview, and three at the second (Contextualizing Learning was added). However, no
indication of the Contextualizing Learning conception was apparent at the third interview.

In Groups 2 and 3, both TO and ZZ held only one identifiable conception (Communicating Content) at their first interviews. In Group 2, two conceptions were held by TO at the second interview (Inspiring Learning was identified), and three at the third (Contextualizing Learning was identified). In Group 3, a second conception held by ZZ (Contextualizing Learning) was identified during the second interview, and remained present at the third.

KU taught sociology (humanities), while TO and ZZ both taught in the sciences (chemistry and food sciences respectively).

TABLE 18
Changes in Conceptions During Three Interviews

<table>
<thead>
<tr>
<th>Group</th>
<th>TA, Department, Year of Students</th>
<th>No. of Conceptions Held by Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>KU (Sociology 2)</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>TO (Chemistry 1)</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>ZZ (Food Sciences 4)</td>
<td>1</td>
</tr>
</tbody>
</table>

* The groups were established on the basis of the combinations of conceptions held by the TAs.
Discussion

Over the course of the three interviews, TAs expressed beliefs consistent with different combinations of one, two or three conceptions of teaching. Six of them expressed consistent beliefs, and were not identified as changing their conceptions, during this time. Three expressed additional beliefs consistent with one or two more conceptions during the different interviews; their combinations of conceptions were thus identified as changing. One of those three expressed additional beliefs during the second interview which were not identified during the third.

The data are too limited, due to the small number of participants and the impact of the strike, to establish why those who changed their conceptions did so. However, comparison of these results with the literature provides at least five possible avenues for future investigation.

First, some researchers postulate that teachers may have two sets of beliefs about teaching: an ideal belief system coincident with their views about the aims of education, and a working conception applicable to the context in which they teach (Menges & Rando, 1989; Samuelowicz & Bain, 1992; Zeichner & Tabachnick, 1985; Zeichner, Tabachnick & Densmore, 1987). Some support for this possibility has emerged from three of the TAs interviewed. For example,

[Teaching and learning] is a growing thing but it's all linked up--it's not like some little flower coming out there in the middle of the grass. It's something that everybody--the students are all driving each other and their teachers and, you know, the whole thing is hopefully working like that. That's an almost idealistic
kind of a portrait. . . . But that doesn’t mean that it’s not true that that’s the way I think about it. (KU3/104-105)

A teacher may have some concept of an ideal way of doing it [teaching] or the ideal way of presenting stuff to ideal learners which usually doesn’t occur. . . . you may have some sort of an ideal in your mind that you’re going to have to modify over time—in specific instances, [as a result of students’] feedback or your perception of what’s going on. (ZZ3/7-8)

. . . somewhere there’s a conviction that what I’m doing is worthwhile . . . that for a lot of students what they’re learning is going to be useful to them . . . . With the courses that I taught here, it’s very very hard to believe [that]. And so as I said, that’s a conviction that I would like to have, it’s one I don’t have because of the system. (QD1/59-60)

Although ideal and working conceptions and their relationships were not the focus of this research, it appears that further research could increase our knowledge in this area. Such research could also be important in considering changes in conceptions. For example, if people hold both ideal and working conceptions, how many of the changes which occur do so through amendments made to ideal conceptions based on the contexts within which teachers work? Do they ever amend their working conceptions based on their ideal ones? Are the conceptions which have been identified by researchers to date working conceptions, ideal conceptions, or some combination of both? What is the relationship between them? Does it vary depending on what the conceptions are? How does this relationship influence their teaching?

Second, Samuelowicz and Bain (1992) were able to identify distinctly different conceptions of teaching, that vary according to the level of students. Some support for this
distinction among conceptions has emerged in this research. For example,

This is a very basic course, and mine is a very basic task, and so the things that I see as my job to do with this group are very basic you know. . . . I think I would probably approach [teaching] quite differently if they were third year students or if they were all second year students. (KU1/35-36)

I think specifically for first year[s] . . . it's really important that instructors care about you just a little bit. Because it's such an incredibly alienating experience--first year. (KC3/63-64)

Further research in this area could also provide useful insights into changing conceptions. For example, how do the individual's conceptions for different levels of students differ, and how are they similar? Do those who teach students at different levels hold differing conceptions? What influence do these conceptions have on the process of changing conceptions? Third, Dall'Alba (1991) postulated that beliefs about teaching may not be totally context or subject related; she finds that some teachers in different content areas and contexts share similar conceptions of teaching. This is supported by the "snapshots in time" presented above. Yet what is the extent to which conceptions are context or subject related? Is it only teachers in particular content areas who share conceptions? Or can common conceptions be found across all content areas? Are some common conceptions more prominent in some areas than others? If so, why? What are the specific influences on conceptions of different contexts? If teachers change content areas, do their conceptions change?
Fourth, Richardson et al. (1991) identified the possibility that inconsistency between actions and beliefs may be an indication that teachers are in the process of changing their beliefs about teaching, and that beliefs change first. However, Guskey (1986) argues that success in changing actions leads to changes in beliefs. The three TAs whose conceptions changed in this research stated that they had not changed their teaching actions following the teaching training program; however, whether they might have done so if the strike had not intervened is unknown. They did exhibit some minor inconsistencies between their beliefs, as expressed in the second interview, and their teaching (which remained the same) following their participation in the teaching training programs. However, because of the strikes, it was not possible to observe their teaching to see whether or not the inconsistencies continued or changed. Whether such inconsistencies are an indicator of the process of change requires further investigation.

Finally, the TAs involved in this research attended a teaching training program and participated in three interviews about their teaching during this period. Eight of the nine found either the training program, or the interviews, or both, beneficial in helping them further develop their understandings of teaching. With respect to the training program, for example,

I thought it was a very good experience, I really enjoyed it. [It was] personal growth for me--[I] had a chance for me to reflect on me . . . . I learned something about
myself . . . I came away feeling a lot more confident about [teaching]. (TQ2/19-20)

With respect to the interviewing process,

It’s been a really helpful process for me. I did it thinking it would, you know, help you. It didn’t occur to me that it would help me too. And it really has. My students thank you though they don’t realize that. (KC3/122-123)

I had no idea I had so much to say about this topic. So you must have asked some good questions. It’s been good to examine my point of view. (QE3/9)

With respect to both,

I’ve found thinking about your questions almost as useful as the workshop itself. So I think the whole—the overall process has been very helpful. (DL3/52)

I think that—you coming and interviewing and the course in general has been good because it’s forced us to give up time to think about [teaching]. And I’ve noticed it’s easy—not to think about these things . . . because you’ve got so many other things to do. (T03/47)

The specific influences of these interventions on the TAs’ conceptions of teaching were not investigated. As other researchers have indicated, however, this may be a fertile area for future research (Holt & Johnston, 1989). For example, how do such interventions influence changes in conceptions? Are the changes stimulated by such interventions maintained? In what ways do specific interventions leading to opportunities for reflection initiate more or different changes in conceptions than would occur otherwise?

Summary

This chapter has completed the presentation and discussion of findings from this research. It moved beyond
global conceptions, the focus of Chapter Four, to consideration of the seven common constituent dimensions of the four global conceptions. The seven dimensions were defined, and the unique profiles which they formed, defining the global conceptions, were discussed.

These constituent dimensions were compared and contrasted with the nineteen TDs in five categories derived from the literature. The relationships among the dimensions were analyzed, and the number of potential common dimensions which could have been used to define the four global conceptions reduced. Seven were derived from the research, and can be considered actual, not potential dimensions. Remaining potentially relevant dimensions were identified from the literature. More research is needed in this area.

Possible relationships among the conceptions postulated by other researchers--hierarchical, ordered, different but equally valid--were examined in terms of these results. Further research with more participants is needed before any definitive conclusion as to these relationships can be reached.

Similarities and differences among the conceptions held by various TAs at the times of the different interviews were presented and discussed. Those instances where changes in conceptions occurred were noted, and possible explanations requiring further research suggested.

Chapter Six will conclude this thesis by integrating and highlighting those findings most relevant to the study of the
belief aspects of thought structures. Implications for future research and practice will be discussed.
CHAPTER SIX
LOOKING TO THE FUTURE

Scholars approach their work with an attitude of questioning, an excitement of exploration, and a dedication to staying on the cutting edge of their particular disciplines. The application of that attitude of inquiry to teaching can advance our personal understanding of the process almost as rapidly as we advance our disciplines.

Marilla D. Svinicki
Changing the Face of Your Teaching

Improvements in the way we teach in post-secondary education are needed. Yet when we talk about teaching, frequently one of us may not understand what the other means, even when we are using the same words. Before we can improve what we are doing, we must first be clear about the beliefs and values underlying our differing conceptions of teaching, clarifying for ourselves what we mean by what we say. Changing what we do when we teach, without understanding and being committed to the values underlying the changes, is not likely to lead to lasting improvement.

In post-secondary education, teaching assistants are often the faculty members of the future. Yet they have been virtually ignored in research examining beliefs about teaching. This research began to address this gap, by focusing on teaching assistants and exploring the similarities and differences among the beliefs they held about teaching.
Summary

The purpose of this research was to inquire into the conceptions of teaching held by a small group of teaching assistants, and to discover whether and in what way their conceptions of teaching changed: (1) after participating in a teaching training program; and (2) after they had subsequently taught in their own teaching contexts, when they might or might not have applied what they had learned. Thus the research explored their initial conceptions of teaching, explicit or implicit, and identified changes in those conceptions during the research period.

The research was a constructivist inquiry, using the qualitative approach of phenomenography, which yields global conceptions as findings. This approach was modified, following a recent methodological advance to incorporate the extraction of constituent dimensions from the conceptions. A unique profile of dimensions thus defined each global conception.

I conducted interviews with nine teaching assistants three times each: before they attended a teaching training program, immediately after they attended the program, and four to eight weeks later. I also observed each TA teaching in her/his own context once, and asked each one to complete a survey-type demographic questionnaire.

Five women and four men participated in this research. Two were teaching assistants in the same department; each of
the others taught in a different department or faculty. Two were between 17 and 24 years old, four between 25 and 34 in age, and three between 35 and 44. Their experience as teaching assistants ranged from one month to six years. Five taught discussion sessions, two taught science labs, one taught a science course, and one was to teach a humanities course the following summer.

These TAs appeared to be similar to those who have been examined by other researchers. They juggled conflicting responsibilities as graduate students and TAs; believed that this research oriented university supported teaching minimally, if at all; maintained varying relationships with their teaching supervisors; were concerned with formulating beliefs about and criteria for evaluating others; and had received little or no teaching training prior to their participation in these training programs.

Four qualitatively different conceptions of teaching were identified using standard phenomenographic methodology. The global conceptions which characterize these conceptions include: (1) Communicating Content--Sharing Concepts, (2) Contextualizing Learning--Knowledge in Action, (3) Developing Scholars--Advancing a Discipline, and (4) Inspiring Learning--Honouring Curiosity. The focus and goals of each are briefly described below.

The focus in Communicating Content is on content, and communication of that content to the learners. Teaching assistants with this conception of teaching have two goals for
their teaching: (1) to interest learners in the material, and (2) to prepare learners for examinations or other forms of evaluation.

The focus in Contextualizing Learning is on facilitating understanding to foster the learners' ability to apply what they have learned in the "real world," when they no longer have a teacher to assist them. Teaching assistants with this conception of teaching see learners applying either knowledge (facts), or mechanisms which help them understand knowledge, or both, in the real world.

The focus in Developing Scholars is on helping learners develop the ability to think and work as scholars, academics within a university setting. Teaching assistants with this conception of teaching have two goals for their teaching: (1) to help learners discover their own intellectual questions, and (2) to help learners find answers to those questions in ways which are academically acceptable.

The focus in Inspiring Learning is twofold: (1) getting students excited about learning--learning something, learning anything; and (2) helping students learn how to learn, so that eventually they will be able to learn without teachers. Teaching assistants with this conception of teaching believe that people will be learning throughout their lives; that learning is part of what makes life exciting, joyous, and empowering; and that those who love learning will enjoy their lives more.
In examining these global conceptions collectively, four related beliefs common to all were identified: (1) learners are participants in the teaching-learning process, (2) individual diversity among learners is understood to affect learning, (3) teaching involves helping learners develop an interest in content, and (4) teaching is communicating with learners. Differences among the conceptions with respect to these beliefs related to how they were practically implemented by the teaching assistants. Analysis of these common beliefs illustrated that these TAs believed that two parties are involved in the teaching-learning process--the teacher and the learners, and that teaching is a sharing of knowledge about content, process or both.

Differences among the four global conceptions were examined by looking at each conception individually. They were seen to differ with respect to beliefs about commitment, responsibility, understanding of how to teach well, credibility, challenge as teachers, and accountability.

These global conceptions were then compared and contrasted with global conceptions emerging from previous phenomenographic research into conceptions of teaching, and with findings from related research involving teaching assistants. Although numerous similarities were noted and discussed, it was not possible to determine whether these similarities described the same conceptions, because of differences in how they were characterized by various researchers.
During the second stage of the analysis, the four global conceptions were compared and contrasted, to extract their common implicit dimensions. Seven constituent bi-polar dimensions were found to describe the global conceptions: (1) learner diversity--does not affect learning/is important to learning; (2) learner autonomy--teacher responsibility/joint responsibility for learning; (3) orientation of learning--evaluation, prescribed requirement/application, personally relevant; (4) expected outcomes of learning--quantitative, know more/qualitative, know differently; (5) knowledge and meaning--stable, external to learner/changing, constructed by learner; (6) teaching-learning process--one-way transmission, emphasizing product/two-way cooperation, emphasizing process; and (7) focus of teaching--on content/on learners.

The same dimensions were used to describe all four conceptions. Within each conception, some aspects of the dimensions were held in common with other conceptions, and some differed. Thus, with this approach, what defined and delimited the qualitatively different conceptions were the unique profiles of the dimensions. These profiles are summarized in Table 19 below.
<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Conceptions of Teaching*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CC</td>
</tr>
<tr>
<td>Learner diversity</td>
<td></td>
</tr>
<tr>
<td>A - does not affect learning</td>
<td>Ab</td>
</tr>
<tr>
<td>B - is important in learning</td>
<td></td>
</tr>
<tr>
<td>Learner autonomy</td>
<td></td>
</tr>
<tr>
<td>A - teacher responsibility</td>
<td>Ab</td>
</tr>
<tr>
<td>B - joint responsibility</td>
<td></td>
</tr>
<tr>
<td>Orientation of learning</td>
<td></td>
</tr>
<tr>
<td>A - evaluation, prescribed</td>
<td>A</td>
</tr>
<tr>
<td>B - application, personally</td>
<td></td>
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<tr>
<td>relevant</td>
<td></td>
</tr>
<tr>
<td>Expected outcomes of learning</td>
<td></td>
</tr>
<tr>
<td>A - quantitative, know more</td>
<td>A</td>
</tr>
<tr>
<td>B - qualitative, know differently</td>
<td></td>
</tr>
<tr>
<td>Knowledge and meaning</td>
<td></td>
</tr>
<tr>
<td>A - stable, external to learner</td>
<td>A</td>
</tr>
<tr>
<td>B - changing, constructed by</td>
<td></td>
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<tr>
<td>learner</td>
<td></td>
</tr>
<tr>
<td>Teaching-learning process</td>
<td></td>
</tr>
<tr>
<td>A - one-way transmission</td>
<td>Ab</td>
</tr>
<tr>
<td>B - two-way cooperation</td>
<td></td>
</tr>
<tr>
<td>Focus of teaching</td>
<td></td>
</tr>
<tr>
<td>A - content</td>
<td>A</td>
</tr>
<tr>
<td>B - learners</td>
<td></td>
</tr>
</tbody>
</table>

* CC = Communicating Content  
   CL = Contextualizing Learning  
   DS = Developing Scholars  
   IL = Inspiring Learning
Nineteen tentative dimensions (TDs) derived from the literature were compared with the seven constituent dimensions emerging from the research. Seven tentative dimensions were equivalent to the constituent dimensions. Some aspects of the twelve tentative dimensions, not specifically equivalent to those seven constituent dimensions, can be identified within one or more of those seven dimensions. At the same time, aspects of these TDs have been identified which are not accounted for by the constituent dimensions.

The number of potential common dimensions which could have been used to define the four global conceptions identified in this research has been reduced from nineteen. However, further investigation is necessary to determine what the number may be. Seven constituent dimensions were derived from the data, and can be considered actual, not potential dimensions. The remaining number of potentially relevant dimensions includes the two TDs from the 'context' group of beliefs, and aspects of the learning (fragmented or holistic) TD, the teacher-learner relationships (distant or personal) TD, and the creation of a favourable climate for learning TD. Further research is needed in this area.

Thus seven common constituent dimensions form the basis for the relationship among the four global conceptions. Other researchers have classified the relationships among conceptions which they identified as either hierarchical, ordered, or equivalent and equally valid in differing contexts. An examination of these three possibilities for the current data
led to the following conclusions. These conceptions are not hierarchical; if they are ordered, more work is necessary to determine and justify the ordering principle. Perhaps the conceptions are applicable in different contexts and equally valid; however, this must be established through further research with larger populations.

Similarities and differences among the conceptions held by the TAs at the times of the different interviews were presented and discussed. Six TAs retained the same combinations of multiple conceptions throughout the series of interviews. Changes in combinations of conceptions were identified among three TAs, and possible explanations requiring further research were suggested.

Conclusions and Recommendations

These findings suggest future avenues for research that could enhance understanding of our dynamic and evolving beliefs about teaching, and of the influence these beliefs have on our practice. They have methodological implications for the study of teaching beliefs. Further, they suggest recommendations for practice related to the initial training of TAs, and to their subsequent development as teachers. These implications are tentative and made with caution, given the limitations on transferability of these findings. At the same time, these findings have so much in common with those of other researchers that their commonality supports these recommendations.
Relevant conclusions, controversies and outstanding questions are noted to provide a context for the applicable recommendations. Many of these topics are related; in some cases they overlap. For the sake of clarity, they are organized into four categories: (1) conceptions; (2) changes in conceptions; (3) methodology; and (4) teaching training. However, none of the suggestions are mutually exclusive, and investigation of one aspect is likely to involve consideration of others.

Conceptions

Comparison of Conceptions?

Comparison between the global conceptions identified in this research and the findings of other researchers indicated that numerous similarities exist. The amount of research completed to date is such that a meta-analysis would benefit everyone working in this area. Yet, because of the different ways in which researchers have characterized global conceptions, it is not possible to determine whether two or more global conceptions which appear similar are indeed describing the same conception. The extraction of constituent dimensions from global conceptions, and the subsequent definition of those conceptions as unique profiles of dimensions, offers one way of beginning to resolve this quandary.
To conduct a meta-analysis involving the use of dimensions to define, compare, and contrast global conceptions, it may be necessary to involve the original researchers in comparing and contrasting their own findings to extract constituent dimensions, and subsequently analyzing the results to reduce overlap among the dimensions. Thus the process of establishing standard constituent dimensions to be used for comparative purposes could begin. Alternatively, researchers could re-code their transcripts using the set of dimensions emerging from this research and/or that established by Samuelowicz and Bain (1992), and compare the global conceptions thus defined with their previous results. This would test the usefulness of these particular dimensions as a means of defining conceptions across contexts. Yet another possibility is that individual researchers using standard phenomenographical methodology in the future could expand the process to include extraction of dimensions from the global conceptions identified. This would simplify the process of comparing and contrasting future findings.

Ideal and Working Conceptions?

Indications from this research support the idea that individuals may hold both ideal and working conceptions of teaching (Martin & Balla, 1991; Samuelowicz & Bain, 1992; Zeichner & Tabachnick, 1985; Zeichner, Tabachnick & Densmore, 1987). Yet I am unaware of research which has specifically focused on investigating this possibility and its implications.
Researchers interested in this issue could explore the question of whether individuals hold both ideal and working conceptions of teaching. Further, both researchers and practitioners would benefit from understanding the influence of these dual conceptions: (1) on practice, and (2) on the process by which individuals change their conceptions. Additional investigation might examine whether people teaching in particular settings hold particular ideal and/or working conceptions related to those contexts.

Variation by Content Area or Context?

This research identified common conceptions of teaching held among individuals teaching in eight content areas in varying contexts. Conversely, the data also indicated that some aspects of these conceptions may be context and/or content specific. Both possibilities have been suggested by other researchers (Dall’Alba, 1991; Samuelowicz & Bain, 1992). Given these indications, some aspects of conceptions of teaching may be common across all teaching situations, whereas others may be context and/or content related. Investigation of the relationships between conceptions of teaching and context and/or content areas could yield valuable results, relevant to both research and practice.

Hierarchical, Ordered or Equivalent?

The profiles of dimensions illustrate the relationships among the four global conceptions found in this research.
However, controversy exists about whether within such relationships conceptions can be regarded as hierarchical, ordered, or equivalent and equally valid in different contexts (Dall’Alba, 1991; Fox, 1983; Martin & Balla, 1991; Pratt, 1992; Samuelowicz & Bain, 1992). It is possible that this issue may not be resolved until there is some consensus on the limited number and definitions of conceptions of teaching which exist, and more research with larger groups of participants, in a variety of settings, is conducted. Such research should focus specifically on establishing and justifying the type(s) of overall relationship(s) which exist among conceptions of teaching.

**Changes in Conceptions**

**Basis for Common Beliefs**

Four beliefs common to all four global conceptions were identified when the conceptions were examined collectively. The focus of all four beliefs was on teaching as a sharing of knowledge about content, or process, or both: that is, teaching as communicating with learners. This differs from some of the conceptions identified by other researchers, where the learners were not considered important participants in the process (Fox, 1983; Dall’Alba, 1991; Pratt, 1992). It is interesting to speculate on the possible relationship between this focus on communicating with learners across all conceptions, and the fact that the participants were TAs who
were at the same time teachers and learners themselves. Longitudinal research investigating conceptions held by individuals as TAs, as new faculty members, and after they have been granted tenure could yield useful insights into possible changes in focus in common beliefs given changes in teaching context. Researchers might also compare conceptions held by faculty members who were once TAs with those held by faculty members of similar experience who had not been TAs.

Multiple and/or Changing Conceptions

Some TAs participating in this research initially held only one conception of teaching. Others held two or three. Further, the two TAs who began with one conception were among the three who changed their combinations of conceptions during the research period. Additional work is necessary to identify the variety of multiple conceptions of teaching held by some individuals, and the relationships among those conceptions.

Given that multiple conceptions are often contradictory, understanding the process of conflict resolution used by participants could provide significant insights into the interactions among thought structures, thought processes and actions, and thus into the process of changing beliefs about teaching. Other factors which may influence that process and could be considered include teaching experience with different content and in different contexts, previous teaching training, relationships with mentor teachers, extent to which individuals reflect on their teaching, etc. Exploration of the
relationship(s) between the conceptions held by the instructor(s) of a teaching training program and the conceptions held and/or new conceptions developed by the trainees could also advance understanding of how teachers acquire and modify their beliefs. Other research could focus on the combinations of conceptions held at various stages by different individuals. Can particular orders of combinations be identified? If so, are those groupings always followed in the same way in every change process?

**What Changes First?**

Researchers have different opinions about whether changes in beliefs precede changes in actions (Richardson, Anders, Tidwell & Lloyd, 1991) or whether experiencing positive results from changes in actions leads to changes in beliefs (Guskey, 1986). Another possibility is that change may occur in either direction, and other factors may determine which procedure is more important in a given context. Investigations aimed at identifying the steps involved in the process of changing beliefs could be enlightening, providing valuable insights for teacher trainers.

**Methodology**

When using a phenomenographical approach, different researchers may focus on different aspects of the relationships between the individual and the phenomenon. This potential difference in focus is compounded because of the complexity of
most individual-phenomenon relationships. As a consequence, one of the drawbacks to the use of phenomenography has been the difficulty in comparing conceptions of the same phenomenon identified by different researchers. Despite this challenge, phenomenographers are interested in identifying the logical relationship(s) that exist between different conceptions of the same phenomenon. In doing so, their goal is to describe the similarities and differences both within and between the conceptions. Further, transferability in phenomenography is partly a function of the extent to which the findings--conceptions of teaching--can be compared among various groups in different situations.

I found that using constituent dimensions to define the global conceptions provides a clear way of identifying and discussing areas of overlap in conceptions, and establishing how those conceptions are related. Comparison of one researchers' phenomenographic results with those of another is eased. Further, it may be, as Samuelowicz and Bain (1992) claim, that constituent dimensions may be more stable (across samples and methods of analysis) than complex conceptions. Phenomenographic researchers investigating conceptions of teaching, as well as those using other methodologies, may wish to incorporate the use of dimensions into their work, given the extent and variety of the research into beliefs about teaching now being undertaken.
Teaching Assistant Training

Research has shown that most teaching assistant training programs present methods and techniques which are intended to help TAs change their practice (McKeachie, 1986; Zahorik, 1986). The relationships between beliefs and practice, and the differences which exist among individual’s conceptions of teaching, are seldom discussed. Yet as other researchers have demonstrated, when TAs are unaware of these differences, proposed changes to teaching behaviour that are at odds with their beliefs are unlikely to be embraced or implemented with enthusiasm, thoroughness or persistence (Ernest, 1989; Hewson & Hewson, 1989; Lester & Mayher, 1989; Pratt, 1992).

Indications from this research support the conclusions of others who have demonstrated the value for teachers of discussion, clarification, reflection, and articulation of beliefs about teaching, and the subsequent development of more congruent teaching practices (Holt & Johnston, 1989). Such discussion also helps TAs who are often struggling among multiple, tentative, and seriously conflicting conceptions of teaching, to develop and clarify their own beliefs, to understand the variety of conceptions of teaching known to exist, and to examine the implications of such conceptions for their practice.

There are a number of ways to introduce this discussion and reflection to TA training programs. For example, individual TAs could keep a journal of their internal reflections and questions, to help them articulate their
beliefs and their understanding of how beliefs change over time. At the beginning of teaching training programs, instructors might discuss their personal conceptions of teaching, the differences among those conceptions, and the understandings of teaching which are encouraged at a particular institution.

Follow-up sessions, in which trainees now teaching could continue the discussion and reflection process, may provide valuable support for individuals involved in changing their conceptions. For example, two of the three TAs in this research who changed the combinations of conceptions they held appeared to begin the process as they reflected on the diversity of their learners, and the extent to which they could or should attempt to meet that diversity. It was apparent in both the second and third interviews, after the topic of learner diversity was introduced during the training programs, that they were reflecting on this issue, and valued the opportunity to discuss it further.

Agenda of Research and Practice

Several themes run through the conclusions and recommendations emerging from this research, suggesting an agenda of research and practice. Relevant research projects include:

1. Expanding and further testing the concept of using constituent dimensions to define combinations of belief aspects of thought structures about teaching.
2. Comparing and contrasting the relationships among those conceptions of teaching currently identified by all researchers.

3. Developing more detailed understandings of the relationships between particular beliefs about teaching and their specific implications for practice.

4. Establishing the overall type of logical relationship(s) which exist(s) among conceptions, and the implications of such (a) relationship(s) for teacher development and the process of changing conceptions.

5. Inquiring into the relationships between contexts and conceptions of teaching, and between content areas and conceptions of teaching.

6. Investigating the relationship between ideal and working conceptions of teaching held by single individuals.

7. Conducting longitudinal research into the conceptions of teaching held by TAs who become faculty members, and how they change over the course of their academic careers.

8. Assessing the relationships among the multiple conceptions of teaching held by single individuals, and the process by which these change over time.

Relevant suggestions for practice include:

1. Training faculty developers about the importance of the relationship between beliefs and practice.

2. Encouraging faculty developers and teaching instructors to explore the conceptions of teaching which they hold,
and to reflect on how their beliefs influence their practice.

3. Supporting faculty developers in articulating their understandings of the accepted conceptions of teaching at their institutions, why that is the case, whether they agree or disagree, and what steps they could take to try to change those institutional conceptions.

4. Revising teaching assistant training programs to include discussion and reflection about conceptions of teaching, in conjunction with training in techniques and methods.

5. Providing follow-up sessions to teaching training programs, focusing on articulation of beliefs about teaching and questioning of those beliefs, as a support mechanism for TAs in the process of changing conceptions.

Conclusion

As academics interested in the improvement of post-secondary teaching, we are challenged to understand and articulate our differing conceptions of the phenomenon of teaching. As a process of personal discovery, this can lead us to make our beliefs and actions more congruent, and thus ultimately to improve our practice. As a focus for research, it can provide us with a solid foundation from which to begin to understand and discuss the contrasting and often apparently conflicting beliefs and practices of others. As a goal for practitioners, meeting this challenge can suggest improvements
to our teaching training programs which will help others to meet it.

This research has addressed the gap existing in our knowledge of the conceptions of teaching held by teaching assistants. It has shown that numerous similarities exist between the conceptions held by this group of TAs, and those identified by other researchers who have worked with faculty members and adult educators. It confirms that changes did occur in the combinations of conceptions held by some TAs during the research period. Further, this research has contributed methodologically to the study of beliefs about teaching, by demonstrating the benefits of using profiles of common constituent dimensions to define and compare conceptions. Finally, it has identified gaps in our knowledge, suggested improvements to our practice, and highlighted areas worthy of more in-depth investigation which will contribute toward improving teaching in post-secondary education.

As one of the research participants said,

Teaching is . . . a goal to work towards. Those times when I say something and the person’s face goes, ‘Oh!’ and the light really goes on, whatever you want to call that . . . .

KC/2-54/55
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APPENDIX A: CONTACT LETTER

Note:

The focus of this research changed during the research process from an initial emphasis on changes in conceptions to an emphasis on the conceptions themselves and the methodology used to define them. This change occurred for several reasons: (1) the limitations imposed by the strike on the initial research design, (2) my realization that the time period of the research was inadequate to focus on such changes in any detail, (3) my increasing interest in testing the modified phenomenographic methodology, and (4) the limited number of participants (three) who demonstrated any changes in their conceptions of teaching through their spoken beliefs about teaching. Consequently, the final title for this research was changed from that indicated in the contact letter below, to better reflect the revised emphasis of the research.

************

January 1992

Dear Teaching Assistant:

We would like to request your cooperation in the conduct of a study of conceptions of teaching--what people think teaching is. The study is entitled "Changing conceptions: Influence of a teaching training program on T.A.'s understandings of teaching." We hope to learn more about whether and how teaching assistants' understandings of teaching change after participation in a Teaching Training Program. This information will contribute to research in education, and may be beneficial to future teaching assistants.

If you should decide to participate, you will be interviewed about your teaching three times--once before you participate in the Training Program, once immediately after you have participated in the Program, and once about two months following the Program. Each interview will take between one and one half to two hours, for a total time commitment on your part of from four and one half to six hours. The interviews will be tape recorded for transcription of your responses and future coding of the data. You will also allow the researcher to observe your classroom/tutorial/seminar three times while you are teaching--once before participating in the Training Program, immediately afterwards, and about two months after the Program.
Any information obtained in connection with this study that can be identified with you will remain confidential. Participants will be identified by first name only on the tapes, and transcripts will be coded, changing the names of the respondents. Only sample quotations not attributed to any specifically named individual will be reported in any publication. The interviewer will be the only person who will be able to identify you by name.

Your decision as to whether or not to participate will not prejudice your relations with the Faculty Development Project, your Department, the Faculty of Education or the University. If you decide to participate, you are completely free to withdraw consent and discontinue participation at any time.

If you are interested in participating in this study, please sign one copy of the attached form, and return it via Campus Mail in the envelope provided. Keep the second copy for your records.

If you have any additional questions, please contact Janice Johnson at 822-2946 (days) or 222-4189 (evenings). Thank you.

Sincerely,

Janice B. Johnson    Daniel D. Pratt
M.A. Student     Associate Professor
Adult Education     Administrative, Adult

& Higher Education
APPENDIX B: CONSENT FORM

Changing conceptions: Influence of a teaching training program
on T.A.s' understandings of teaching

CONSENT FORM

I have decided to participate in a study of teaching entitled "Changing conceptions: Influence of a teaching training program on T.A.s' understandings of teaching." The researchers conducting this study hope to learn more about whether and how teaching assistants' understandings of teaching change after participation in a Teaching Training Program. This information will contribute to research in education, and may be beneficial to future teaching assistants.

I will be interviewed and will allow the researcher to observe my classroom/tutorial/seminar while I am teaching three times--once before, once immediately following, and about two months after my participation in the Teaching Assistants' Training Program. Each interview will take from one and one half to two hours, for a total time commitment on my part of from four and one half to six hours. The interviews will be tape recorded for transcription of my responses and future coding of the data.

Any information obtained in connection with this study that can be identified with me will remain confidential. Participants will be identified by first name only on the tapes, and the transcripts will be coded, changing the names of the respondents. Only sample quotations not attributed to any specifically named individual will be reported in any publication. The interviewer will be the only person who can identify me by name.

My decision as to whether or not to participate will not prejudice my relations with the Faculty Development Project, my Department, the Faculty of Education or the University. If I decide to participate, I am completely free to withdraw consent and discontinue participation at any time. Should I have any questions about the procedures as outlined above, I can contact Janice Johnson at 822-2947 (days) or 222-4189 (evenings).

My signature indicates that I have read the information above and have decided to participate in this study. I realize that I may withdraw without prejudice at any time after signing this form should I decide to do so. I have kept the second copy of this letter for my own records.

Signature

Date
APPENDIX C: DEMOGRAPHIC QUESTIONNAIRE

The following summary information will help the researchers in determining your conceptions of teaching. Thank you for your assistance.

General

Name: ____________________________________________    Sex: ______

Age: 17-24 _____   55-64 _____   25-34 _____   65-74 _____   35-44 _____   75+ _____   45-54 _____

Previous Degree(s):    Field of Study:

____________________________________________________

____________________________________________________

____________________________________________________

____________________________________________________

As a Teaching Assistant (T.A.)

Department in which you are a T.A.: _____________________________

Length of time you have been a T.A.: _____________________________

Course(s) you are teaching and number of students in each course:

____________________________________________________

____________________________________________________

____________________________________________________
Your duties as a T.A. include (please check all that apply):

- teaching classes alone ___  developing curriculum ___
- team teaching classes ___  following set curriculum ___
- teaching labs ___  setting assignments ___
- teaching tutorials ___  marking/grading ___
- meeting with students ___  other (please specify) ___

**Teaching Training**

Have you had any previous teaching training? Yes ___ No ___

If yes, who sponsored and conducted the program?

________________________________________________________________________

How long was the program?

________________________________________________________________________

When did you participate in the program?

________________________________________________________________________

The format of the program included (please check all that apply):

- lectures ___  micro-teaching ___
- discussions ___  role playing ___
- video-taping of your teaching ___  other (please specify) _____
- comments from the instructor _____
- comments from other participants _____

**Teaching Experience**

Do you have any other teaching experience? _________

If so, what have you taught? __________________________

________________________________________________________________________

When? __________________________

To whom did you teach it? __________________________

________________________________________________________________________
APPENDIX D: INTERVIEW PROTOCOL

Interview 1

Planning and Preparation

* Describe for me what you teach and whom you teach.
* How long have you been teaching that?
* What kind of formal training do you have in teaching?
* How do you prepare for teaching? What do you do? What are your thoughts or strategies as you prepare? What guides your planning? What are you preparing to do?
* How do you routinely start a lesson or a class session?
* Do you have a routine for ending a session? What is it?
* How would you describe your approach to teaching?
* Would you say there is a relationship between teaching and learning?

Management of Instruction

* What is your responsibility as a teacher? What must you do?
* What are you trying to accomplish with your teaching?
* Think back to a recent teaching episode that went well. Describe it to me. Why did it go well?
* Think back to a recent teaching episode that didn’t go so well. Describe it to me. Why didn’t it go well? What would you do differently next time? Why?
* Who are the ‘challenging’ or difficult learners for you? How do you handle those difficulties? What is your strategy?

Reflecting on Practice/Career

* What does it take to be really good at teaching ____?
* In the future, when you look back on your career, how will you know if you’ve been an effective teacher?
* What do you enjoy most about teaching ____? What do you enjoy least about teaching ____? What are the difficult aspects of teaching ____?
How have you changed as a teacher since you began teaching? What has been influential in bringing about that change?

Abstract Representations of Teaching

* What does it mean 'to teach?'

* Do you have a particular conviction or set of beliefs that are important to your teaching?

* What advice would you offer a beginning TA of ____? Why?

* Can you think of a motto that guides your teaching?

* Can you think of a metaphor that defines teaching?
Interview 2

Introduction

* Remind me again what you teach and whom you teach.

Reflections on the TA Training Program

* What aspects of the TA Training Program were meaningful to you? Why?

* Is there any aspect of teaching you would like to have dealt with in the TA Training that was not dealt with?

* What were your thoughts/feelings at the first session and at the end of the training?

* Can you identify any critical moments (for you) in the TA Training? Why were those critical?

* Are you looking forward to changing anything about your teaching as a result of your participation in the TA Training Program? If so, what will you change? Why?

Management of Instruction

* How would you describe yourself as a teacher?

* What are you trying to accomplish with your teaching? How do you know when you're successful at that?

* What do you do well? How do you know that?

* What would you like to improve? Why? How?

Abstract Representations of Teaching

* Could you complete this sentence for me? "Teaching is ___ ."

* Do you have a particular conviction or set of beliefs that are important to your teaching?

* Once again, can you think of a metaphor that defines teaching? It's fine if you are thinking of a different one now than you did the last time we talked.

* Again, can you think of a motto that guides your teaching? If a different one comes to mind from last time, that's fine.
Interview 3

Introduction

* Again, could you just remind me, for the record, what you teach and whom you teach.

Reflecting on Teaching

* I'm going to show you what some people consider a general model of teaching (next page). It has a number of elements in it, and several inter-relationships between and among the elements. Can you look at it, and start wherever you like, and talk about the elements, the inter-relationships, the representation of the model - anything that strikes you about it in relation to your own teaching. If you were to change this model, how would you change it? Can you draw your changes for me?

* I'm going to give you a piece of paper with the words "I am a teacher who ___________________" on it. Please brainstorm with yourself, and complete the sentence with about 15 - 20 different items, and then we'll discuss them. Don't think about any of the items too long, just put them down.

* How do you see yourself developing as a teacher?

* Do you have a philosophy of teaching? Can you talk about it a bit?

* Can you identify any critical moments (for you) with regard to teaching and your understanding of it between the end of the Training Program and today?

* Did you change anything in your teaching as a result of participating in the TA Training Program? If so, what did you change? Why did you change it? Has the change been successful? How do you measure that success?

* What advice would you offer a beginning TA?

* Again, do you have anything further to say this time about either a metaphor for teaching, or a motto that guides your teaching?

* Do you have anything else about teaching that you'd like to discuss?
A General Model of Teaching

APPENDIX E: DEMOGRAPHIC INFORMATION

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Years as a Teaching Assistant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>17-24</td>
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<td>25-34</td>
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<td>35-44</td>
<td>3*</td>
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<tr>
<td></td>
<td>5</td>
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</tbody>
</table>

* One member of this group dropped out before the completion of the research.

Previous Teaching Training | Teaching Experience Prior to being a TA
---------------------------|----------------------------------------
Yes | No | Yes | No
Male Female | Male Female | Male Female | Male Female
1^ | 1^ | 4 | 5 | 2 | 1 | 3* | 5*

^ This training consisted of 2-3 two hour orientation sessions conducted by the TA Union.

Graduate Degree Working Toward

<table>
<thead>
<tr>
<th>M.A.</th>
<th>M.Sc.</th>
<th>LLM</th>
<th>Ph.D.</th>
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<tbody>
<tr>
<td>Male Female</td>
<td>Male Female</td>
<td>Male Female</td>
<td>Male Female</td>
</tr>
<tr>
<td>3*</td>
<td>4*</td>
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</table>
### Faculties/Departments

<table>
<thead>
<tr>
<th>Faculty/Department</th>
<th>Teaching Area</th>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
<td>Faculty of Law</td>
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<td>3</td>
</tr>
<tr>
<td>Faculty of Agriculture</td>
<td>Food Sciences</td>
<td>1</td>
<td>4</td>
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<tr>
<td>Faculty of Applied Sciences</td>
<td>Chemistry</td>
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<tr>
<td>Faculty of Arts</td>
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<tr>
<td>Theatre and Film</td>
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<td></td>
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<tr>
<td>Geography</td>
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<tr>
<td>Faculty of Science</td>
<td>Mathematics</td>
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<tr>
<td>Faculty of Education</td>
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<tr>
<td>Counselling Psychology</td>
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### Duties as a TA include

<table>
<thead>
<tr>
<th>Duty</th>
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<th>Female</th>
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<tbody>
<tr>
<td>Teaching tutorials/discussion groups</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Meeting with students</td>
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<tr>
<td>Field trips</td>
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<tr>
<td>Marking/grading</td>
<td>4</td>
<td>3</td>
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<tr>
<td>Teaching classes alone</td>
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<td>2</td>
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<tr>
<td>Setting assignments</td>
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<td>1</td>
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<tr>
<td>Following set curriculum</td>
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<tr>
<td>Developing curriculum</td>
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<tr>
<td>Teaching labs</td>
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</table>
APPENDIX F: RESULTS OF INDEPENDENT JUDGE RELIABILITY TEST

Independent judge's categorization of conceptions

<table>
<thead>
<tr>
<th>Conceptions</th>
<th>Possible No.</th>
<th>Judge's No. of placements</th>
<th>Agreement of placements correct as %</th>
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</thead>
<tbody>
<tr>
<td>Communicating Content</td>
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<tr>
<td>Contextualizing Learning</td>
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<td>9</td>
<td>100</td>
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<td>Developing Scholars</td>
<td>20</td>
<td>19</td>
<td>95</td>
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<tr>
<td>Inspiring Learning</td>
<td>32</td>
<td>31</td>
<td>97</td>
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</tbody>
</table>
Conceptions:

In phenomenographic research, conceptions are forms of thought, or different ways in which people understand experiences or phenomena in their worlds. They are abstract, cognitive representations of phenomena, the individual's understandings of the world, the 'filters' through which people see. In this research, they are assumed to be equivalent to thought structures or schemas; thus they incorporate knowledge, beliefs and attitudes.

Conceptions of Teaching:

The qualitatively different ways in which people understand or experience teaching in their worlds.

Teaching Assistants:

Graduate students working on either a masters degree or a doctorate, in a university department which has a graduate program. They are also employees of the university who are reimbursed for their work as departmental teaching assistants. This work varies by department and by teaching assistant position, but may include responsibility for: (1) the planning, teaching, marking, etc. for an entire undergraduate course which may meet up to five hours per week; (2) the planning,
teaching and marking for a tutorial, discussion group or laboratory session, which may meet once per week, or once every two weeks; or (3) marking all assignments for a particular course for which a faculty member is responsible for all other duties.

**Thought Structures or Schemas:**

Our private, informal and often unarticulated theories about phenomena that we experience. Summarizing our previous knowledge, beliefs and attitudes, they provide meaning for and guide anticipation of future similar phenomena. They are differentiated from thought processes, although the two are integrally related in practice. Thought structures are the sources of and provide the basis for thought processes, which lead to actions. They are dynamic and continually evolving, vary widely, and are open to change through thought and experience. The development of thought structures, whether occurring through incremental fine-tuning, or through more radical re-structuring, originates from the operation of thought processes.

**Thought Processes:**

The fluid processes of planning (intentions), interactive decision-making and reflection which occurs before, during and after teaching, and from which arise changes in permanent thought structures.