An investigation of pedagogical expertise in the planning practices of professors with varying degrees of teaching experience

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A thesis submitted to the Faculty of Graduate Studies

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for the degree of

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ABSTRACT

The role of teaching experience has been acknowledged in the development of pedagogical expertise, however, past research has failed to specify the relationship between experience and expertise. The ill-defined nature of the teaching task has led researchers to inadequately define pedagogical expertise directly in terms of years of teaching experience. Moreover, the literature on pedagogical expertise is primarily based on data from school teachers, who typically are not subject matter experts in the topics they teach. This study attempted to establish the differences and similarities between experienced and inexperienced university professors in the planning and delivery of teaching and the extent to which these activities and processes resembled expert characteristics. Indices of teaching effectiveness were derived from both theoretical and empirical sources and applied to the practices of 11 university professors, ranging in experience from 1 to 30 years After the conduction of a lecture, subjects were interviewed and asked to elaborate on planning decisions made prior to teaching and to trace the events of the class. Protocols were then analyzed for the presence of characteristics of pedagogical expertise as defined above. Important differences were revealed between the teaching practices of experienced and less experienced professors which involved: (1) automaticity of activities, (2) teaching a lecture as part of the global task of teaching, (3) knowledge integration, (4) flexibility of plan implementation, (5) use of planning notes, (6) time management, and (7) reflections. Important group similarities were also revealed. Implications for the development of pedagogical expertise are discussed.

RÉSUMÉ

L'expérience d'enseigner a un rôle à jouer dans le développement de la compétence pédagogique des éducateurs. Néanmoins, jusqu'à date, les recherches n'ont pas pu différentier l'expérience de la compétence. L'imprécision des tâches de l'enseignant a mené les chercheurs à définir la compétence pédagogique seulement en termes d'années d'expérience. De plus, les recherches effectuées sur la compétence pédagogique sont basées en grande majorité sur des enseignants du primaire et du secondaire, qui ne sont généralement pas experts dans la matière qu'ils enseignent. Cette étude a tenté d'établir les différences de comportement entre des professeurs d'université expérimentés et moins expérimentés et établir à quel point ces comportements ressemblaient aux comportements d'experts en général. Des mesures de compétence ont été établies à partir des théories et des recherches dans le domaine. Ces mesures ont alors servi à définir la compétence d'onze professeurs d'université dont l'expérience variait de 1 à 30 ans. Après avoir donné un cours, les sujets ont été amenés à discuter de leur planification et du déroulement du cours. Les retranscriptions des entrevues ont été analysées selon les mesures de compétence définies précédemment. Les résultats ont montré des différences dans l'enseignement des professeurs expérimentés et moins expérimentés. Ces différences étaient: 1) l'automatisme des actions; 2) l'intégration de l'exposé du cours dans la mission globale; 3) l'intégration de la matière; 4) application du plan d'une façon flexible; 5) l'utilisation de notes préparatoires; 6) gestion de temps; et 7) réflection. Des ressemblances importantes ont été remarquées entre les deux groupes d'enseignants. Les implications dans le développement de la compétence pédagogique sont alors discutées.

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I would also like to thank the other two members of our research team, Sue Davies and Tim Rahilly, who were always there to lend a helping hand and who became cherished friends in the process. I must also thank my mother for her continued support, but above all, for passing on to me her passion for learning. Finally, I would like to thank all my friends for their encouragement. Special thanks to Nadège Altier, for the encouraging words, the helpful suggestions and the omnipresent sympathetic ear. Special thanks to Philippe who helped me with editorial changes and much more.

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INTRODUCTION

A strong assumption in the field of cognitive science has been that practice is a prerequisite to skilled performance. Whether the skill involves medical diagnosis (e.g., Patel, Evans & Groen, 1988), chess playing (De Groot, 1965) or other problem-solving activities (e.g., Newell & Simon, 1972), competency has traditionally been defined in terms of years of practice. The present study was designed to explore the role of experience in the development of competency as it applies to the domain of teaching in higher education. More specifically, this investigation attempted to assess characteristics of teaching effectiveness in the planning and delivery practices of university professors with varying degrees of experience.

In order to reach a comprehensive operationalization of what constitutes skilled performance in teaching, indices of teaching expertise were extrapolated from both theoretical and empirical sources. To this end, in the following sections, the major theoretical models on teacher cognition will be reviewed and the underlying implications for specifying particular teacher behaviours indicative of excellent teaching will be discussed. As well, a review of the literature on expertise as it applies to the domain of teaching will provide an additional framework for assessing teaching competency. Finally, since teaching is said to be motivated by planning, the empirical literature on instructional planning will be reviewed. This review will be complemented by general expert characteristics involved in the planning process.

DEFINING "EFFECTIVENESS" IN TEACHING

Pedagogical expertise or effective teaching is of great importance to the quality of education at all academic levels, but especially in higher education since its efficacy determines the success in the preparation of students as specialists for the workplace. Teacher effectiveness in higher education has been investigated extensively from the learner's perspective, with the thrust of research being on the study of student evaluations of teaching and faculty development (e.g., Cranton, 1992; Cross, 1992; Elmore & Pohlmann, 1988; Feldman, 1989; Geis, 1991; Marsh, 1983; 1992; Marsh & Hocevar, 1991; McKeachie, 1979). Based on student-evaluation data, Feldman (1989) has identified 10 characteristics of the effective pedagogue which include enthusiasm, rapport, breadth of coverage, clarity and organization. From this perspective, it can be said that teaching effectiveness has been described in terms of presentation characteristics, which pertain to subject matter knowledge, and facilitative qualities, both of which are more closely related to an instructor's personal style. It has been argued, however, that relying exclusively on student ratings in defining competent teaching can be problematic since student evaluations can be influenced by variables not under the instructor's control, such as student expectations or prior knowledge (Dunkin & Barnes, 1985; McKeachie, Lin, Daugherty, Moffett, Neigler, Nork, Walz & Baldwin, 1980). This assertion has led to widespread debate over the validity of student evaluations as an instrument by means of which teacher effectiveness can be characterized (Marsh & Hocevar, 1991; McKeachie, 1986).

Apart from extrapolating characteristics of effective teaching from research on student ratings, until recently, little other research, particularly cognitively-based research, has been conducted on other aspects of post-secondary teacher cognition including effectiveness (Murray, 1991). Moreover, the few research projects in the field have rarely been theoretically-driven (Magnusson & Andrews, 1993) or have been too diverse in epistemological traditions to advance knowledge (Kagan, 1990). One outcome of this diversity has been the emergence of various methodological techniques which have rarely followed a standard set of procedures for data analysis (Munby, 1990). For example, among the techniques used are likert scales adapted from psychometric research (for a review see Kagan, 1990), textual analyses of teachers' think-aloud protocols from cognitive science theory (e.g., Livingston & Borko, 1989; Westerman, 1987), and concept mapping from schema theory (e.g., Beyerbach, 1988). As a result, it has been difficult to collectively interpret research findings on teacher cognition, especially when such findings have been criticized for being highly inferential (Munby, 1990). The fragmented nature of the literature in general and the paucity of research in higher education in particular, indicate that there is a need for more goal-directed cognitive research to examine the complex processes and characteristics of effective teaching.

Two additional reasons further support the need for research on teacher cognition in the context of higher education. The first is that the process whereby teaching effectiveness or expertise develops has largely been left unchartered.

Though the role of teaching experience has been acknowledged as being an important factor in the development of teaching expertise (Grossman, 1989), past research has failed to specify the relationship between the two concepts of expertise and experience (Carter, Sabers, Cushing, Pinnegar & Berliner, 1987). There are instances in the literature, however, where pedagogical expertise has been defined in terms of teaching experience, ranging from 5 to over 10 years (e.g., Korevaar & Bergen, 1992; Peterson & Clark, 1978). Nevertheless, as has been argued (Calderhead, 1991), the process of learning to teach effectively is not just an accumulation of knowledge as a result of exposure to the classroom. Rather, it entails an analysis and processing of that knowledge as it relates to the classroom situation. It is likely, therefore, that a necessary, though not sufficient condition for the development of pedagogical expertise is experience.

Some researchers (e.g., Feinman-Nemser & Buchmann, 1985) have even questioned the contribution of firsthand experience in learning to teach, suggesting that teaching experience may foster the illusion that one has mastered and fully understood the central aspects of teaching. There is an implicit danger in this impression in that it may lead to "premature closure" of metacognitive reflection which is essential in both the monitoring and the revision of behaviour (Shöen, 1983). Support for this assertion can be found in other areas. Sternberg (1989) suggests that the significant contributors to a field are not those who have been in the field the longest but rather are those who are neither new nor so familiar to a field to be entrenched in old ways of thinking.

A second reason which further warrants exploration of teacher cognition in the post-secondary context is that university professors do not receive specific training in pedagogy at the time of their appointment. Thus, it is important to establish a clear understanding as to which processes and aspects of teaching change over time with experience and with expertise.

In summary, as it has been argued in the previous sections, there appears to be a need for research to adopt a more theoretically-driven approach to what comprises pedagogical expertise. Moreover, that pedagogical expertise appears to be a much more sophisticated concept than mere experience in the classroom and an important question in this regard is the extent to which teaching experience might promote pedagogical expertise.

The following sections will review the current major theoretical perspectives on teacher cognition and will discuss the relevance of these theories in specifying teacher behaviours which indicate competency. It is important to note that the majority of existing theoretical models are limited to the context of primary and secondary school teaching. The assumption here is that some of the viewpoints expressed in these models can be generalized to the context of higher education.

THEORIES OF TEACHER COGNITION

The last decade has seen a great upsurge of research on teacher cognition and teaching expertise (Berliner, 1986; 1991; Carter, Cushing, Sabers, Stein & Berliner, 1988; Clark & Peterson, 1986; Kagan, 1990; Leinhardt, 1983; Leinhardt

& Greeno, 1986; Leinhardt & Smith, 1985; Shavelson & Stern, 1981; Shulman, 1986b). Although the literature fails to untangle many confounding variables and much of the research has been limited to the context of primary and secondary school teaching, much insight has been gained into the cognitive processes of teaching, teacher knowledge, and the variables that guide teacher behaviour. On the basis of this literature, teaching has been broadly defined as the complex process of transforming content knowledge into knowledge of instruction (Shulman, 1986a). Thus in its broadest conceptualization, the process of teaching involves construction of plans prior to teaching, quick interactive decision-making in the classroom, and post-active thoughts, reflection, and evaluation of one's teaching practices which may lead to a new understanding of the teaching task (Leinhart & Greeno, 1986; Shulman, 1987).

With regards to teacher knowledge, at least two theoretical perspectives are pertinent in depicting characteristics of skilled teaching. The first (Leinhardt & Smith, 1985) describes teacher knowledge in terms of general teaching skills and domain-specific knowledge which the pedagogue draws from for content presentation. Teaching skills is described as a complex knowledge structure of interrelated sets of organized actions and schematas. Domain-specific knowledge has as resources text materials related to the content area as well as teachers' manuals. It also includes an implicit knowledge component that flags aspects which are hard to teach. This type of knowledge which is developed through experience also involves the ability to integrate goals and subgoals within the

constraints of the teaching task (Leinhardt & Greeno, 1986).

The second theoretical perspective proposed by Shulman (1986b) depicts teacher knowledge in terms of subject matter and pedagogical knowledge and further distinguishes subject matter knowledge as comprising content, pedagogical content and curricular knowledge. Content knowledge refers to the knowledge teachers have about the content area and its structure. Pedagogical content knowledge is defined as the skill of teaching a particular content area and incorporates the instructor's repertoire of different ways of presenting the subject matter. Finally curricular knowledge refers to knowledge about the curriculum as well as the availability of instructional materials and resources.

The particular relevance of Shulman's (1986b) framework to the present study is the distinction he makes between *pedagogical knowledge* (defined as the general ability to organize and manage classroom instruction), and *pedagogical content knowledge* (defined as the unique ability to teach a particular subject matter). According to this distinction, the teacher appears to concurrently draw from two sources of knowledge: teaching methods and subject matter. On the one hand, knowledge of teaching methods provides a general structure to instruction, and on the other hand, knowledge of subject matter organizes the content for instruction. It is precisely this category of pedagogical content knowledge which is "most likely to distinguish the understanding of the content specialist from that of the pedagogue" (Shulman, 1987, p.8). This category is particularly relevant to the context of higher education since university professors

are by definition, experts in their content areas but may or may not have concurrently developed the pedagogical expertise to be effective disseminators of their knowledge. Thus an interesting question in this regard is whether general attributes of expertise transfer across domains.

Burns and Lash (1988) extended Shulman's (1986b) model by describing implications for specific teacher behaviours. They postulated that teachers draw upon their knowledge of delivery systems (a component of pedagogical knowledge) for methods of *presenting* the content of their lessons but that they refer to their knowledge of teaching techniques (part of pedagogical content knowledge) for ways of *organizing* the content. Examples of delivery systems include lecture, demonstration, discussion, and the knowledge of it extends to grouping arrangements or classroom management issues. Teaching techniques, however, are more specific activities that are particularly effective ways of teaching certain topics. Thus, in Burns and Lash's (1988) model of teacher cognition, subject matter knowledge provides the content to be taught, pedagogical knowledge provides the means of *presenting* that content, and pedagogical content knowledge provides comprehensive ways of *organizing* the subject matter.

Both Shulman's (1986b) and Leinhardt and Smith's (1985) theoretical conceptualizations can be used to delineate measures for identifying competency in teaching. For example, an estimate of an instructor's pedagogical knowledge could be attained by assessing the diversity of delivery techniques within an

instructional context. Delivery techniques could include an explanatory mode wherein the instructor orally introduces and explains the material. It could also include a demonstration approach which refers to the illustration of some knowledge or skill or a problem-solving technique where students engage in and are guided through problem-solving activities. Another measure of an instructor's pedagogical knowledge could include the teacher's assessment of student needs and the ensuing adaptation of instruction to meet such needs. Other variables indicative of teachers' pedagogical knowledge might encompass locus of control which refers to the degree to which the instructor controls the classroom, shares power with the students, or allocates control to the students.

Pedagogical content knowledge could be assessed by examining the organization of the content to be presented. This could be done by considering such variables as topic sequencing, appropriateness of delivery techniques, mode of information presentation, and pertinence and linkage of information. Careful examination of such variables could generate indices of informed or good teaching.

As mentioned earlier, these perspectives have evolved on the basis of data on and observations of school teachers. To date, the only theoretical perspective which is reflective of teaching in higher education is put forth by Ramsden (1992). This perspective is set apart from the afore-mentioned theoretical models in that it defines teacher cognition as the beliefs teachers have about their task and the educative process. It consists of three progressively hierarchical theories of

teachers' perspectives on teaching in higher education. The first of these conceptualizes teaching as simple dissemination of knowledge. The lecturer imparts knowledge to the students while the students remain passive recipients of the information. From this perspective, as long as the teacher is an expert in the subject matter, dissemination of knowledge will follow. Such an input-output model appears rather limited to explain learning.

Ramsden's (1992) theory 2 assumes that there is a set of finite rules that will guarantee the ideal learning situation. These rules include ways to motivate students, simple reward-punishment strategies used for evaluation, and techniques for promoting discussion in the classroom. To improve teaching from this viewpoint would merely require elaborating on the teacher's repertoire of teaching techniques. Theory 2 represents a significant improvement over theory 1 but reduces the complex activity of teaching to the simple application of a set of prescriptions to arrive at a product, namely learning. Efficient teaching, however, is more than being a competent technician. It requires reflection and the ability and know-how to select teaching methods which promote the desired kinds of learning.

Ramsden's (1992) theory 3 represents the most developed perspective on teaching which is presumably adopted by only the more advanced, perhaps expert teachers. It asserts that certain conditions are favourable for learning but that these need to be adapted to varying contexts, students' particular needs, and the content area. Theory 3 conceptualizes teaching as a reflective activity which is

inherently unpredictable. From this perspective, "activities of teaching [...] are seen as context-related, uncertain, and continuously improvable" (p.116). Interestingly, the conceptualization of teaching as recursive reflection parallels Shulman's (1987) proposed model of pedagogical reasoning. In this model, teaching begins with an act of reason, continues as a process of reasoning, concludes in pedagogical actions only to be reflected upon some more so that the process may begin again. In addition to *comprehension* of subject matter, *transformation* of that subject matter into teachable pieces of information, knowledge of *instruction*, formative and summative *evaluation* of one's teaching, Shulman (1987) asserts that teachers may *reflect* over their teaching and achieve *new comprehension* of the processes of pedagogy. Unlike Ramsden (1992), however, Shulman (1987) maintains that his model is not a hierarchical set of fixed stages but can better be conceptualized as a dynamic processes of development.

Like Ramsden (1992), Munby (1982) points to the invaluable influence of teachers' views in guiding decision-making and judgement in and out of the classroom. Teachers' beliefs about the educative process presumably underlie the totality of their actions. However, the impressive volume of research investigations of teachers' belief systems has not yielded consistent findings in this regard (for a review see Kagan, 1990; Munby, 1982). For example, Borko, Cone, Russo and Shavelson (1979) found that teachers' beliefs were not significant factors in guiding interactive decisions about classroom management.

Furthermore, Munby's (1982) review of the literature suggested that approximately half of teachers studied appeared not to practice what they advocated. Thus, it might be that teachers' espoused theory of teaching may have little correspondence to their actual behaviour in the classroom after all. This apparent incongruence between teachers' theories and teachers' practices has been documented elsewhere (Magnuson & Andrews, 1993). In an attempt to design profiles of teaching expertise, Magnuson and Andrews (1993) found that their sample of teachers, identified as extraordinary by both peers and administrators, "are constantly trying to bring into congruence espoused theory and actual practice" (p.20). This behaviourial difference between teachers who practice what they advocate in the classroom and those who do not, may point to yet another distinguishing characteristic of teaching expertise: the ability to practice what one advocates as the role of the teacher and what one conceptualizes as the components of an effective instructional context.

In summary, the previous review of theoretical models and their practical implications suggests that pedagogical expertise can be evaluated in at least three ways. The first is to adopt a theoretical approach in delineating characteristics of competent teaching by drawing upon the proposed models of teachers' knowledge structures (e.g., Leinhardt & Smith, 1985; Shulman, 1986b). The second is to establish teachers' espoused beliefs about teaching and the learning process by using Ramsden's (1992) progressively hierarchical model of teachers' belief systems. The final method of assessing teaching expertise is by examining the

degree of congruence between teachers' espoused beliefs and their consistent practices in classrooms.

Other characteristic features of expert teaching can be derived from empirical research on teacher expertise. Furthermore, since pedagogical expertise has been found to resemble expertise in other fields (Berliner, 1986; 1991; Livingston & Borko, 1989), general findings on expertise in other problem-solving domains can also be examined for delineating characteristics of expert teaching. This literature will be reviewed in the following sections.

EMPIRICAL INVESTIGATIONS OF TEACHING EXPERTISE

Empirical investigations of teacher expertise have adapted one of two research methodologies. Researchers have either used the expert-novice paradigm to examine teaching competency (e.g., Carter et al., 1987; Livingston & Borko, 1989) or have opted for a developmental model, studying the learning process of student teachers (e.g., Byra, 1992). Of particular interest here is the former approach which is modelled after investigations of skill competency in complex problem-solving activities (e.g., Newell & Simon, 1972). Research in other fields has helped articulate distinct characteristics of expertise. For instance, we know that experts excel mainly in their own domain, have superior memory capacities, are fast and error-free in problem-solving, have good self-monitoring skills, and possess a more principled representation of their domain knowledge (Glaser, 1984; Glaser & Chi, 1988; Posner, 1988).

Berliner (1986) has successfully demonstrated that these and other indices of expertise can be generalized to the domain of teaching (e.g., Livingston & Borko, 1989). For example, expert and novice teachers have been found to differ in the way they perceive and interpret classroom events (Carter et al., 1988). Experts are more selective in their use of student information during planning (Housner & Griffey, 1983), and in their interactive teaching (Byra, 1992), and have been found to possess a far greater repertoire of instructional and management routines than novices do (Leinhardt & Greeno, 1986; Leinhardt, Weidman & Hammond, 1987). Other researchers (e.g., Westerman, 1991) have identified expert-novice differences in the integration of knowledge: Expert teachers tend to place new learning in the context of students' prior knowledge whereas novices plan each lesson as a discrete unit, without relating it to either students' prior knowledge or to previously taught lessons.

More specific expert-novice differences have been identified in the area of instructional planning. Expert pedagogues have been found to elaborate extensively upon the underlying reasons for their plans whereas novices appear to be incapable of such elaborate justifications (Peterson & Comeaux, 1987; Solomon & Lee, 1991). As well, when requesting information for planning, expert teachers ask qualitatively different questions from novices, although quantitative differences are minimal. Expert teachers' questions centre around student characteristics whereas those of novices reflect concerns about how to write a lesson plan (Solomon & Lee, 1991).

Despite the considerable literature on teaching expertise, several researchers (Berliner, 1986; Lampert & Clark, 1990; Leinhardt, 1990) have underscored the methodological complexities which make it difficult to characterize an expert pedagogue. As in other fields of the social sciences, the ill-structured nature of the domain of pedagogy makes it difficult to unambiguously demonstrate expertise and identify "the" experts, as we might be able to do in well-defined areas such as chess (Berliner, 1991).

One of methodological weaknesses of the studies in this area relates to the criteria applied for sample selection. In defining expert pedagogues, 5 years or more of classroom experience is almost invariably used as the dominant defining characteristic (e.g., Korevaar & Bergen, 1992; Peterson & Clark, 1978; Peterson, Marx & Clark, 1978). Less frequently, researchers have supplemented this characteristic by either considering student outcomes over a period of time (Leinhardt & Greeno, 1986; Leinhardt & Smith, 1985; Leinhardt et al., 1987), or by focusing on administrative rankings of teachers (Carter et al, 1987; 1988; Livingston & Borko, 1989; Reiser & Mory, 1992; Swanson, O'Connor & Cooney, 1990). Seldom have researchers combined several criteria or have triangulated data from both theoretical and empirical sources in their attempt to define the expert pedagogue.

There is an underlying assumption in the research studies of teacher cognition that through the examination of behaviours and reflections of experienced teachers, we can get a glimpse of the way in which experts think and

behave (Strahan, 1989). Although it has been argued that expertise in teaching is a developmental process, as it is in other fields (Berliner, 1991; Dreyfus & Dreyfus, 1986), as yet there is no evidence to suggest that it develops solely as a function of practice (Carter et al., 1987) and is arrived at by anyone who seeks it. Indeed, on empirical grounds, several researchers (Shoenfeld & Hermann, 1982; Swanson et al., 1990) concluded that variables other than years of experience were operating in expert-novice differences since these differences persisted even when the effects of experience were statistically removed. Ericsson and Smith (1991) caution against equating one's years of experience with one's level of expertise and Westling, Koorland and Rose (1981) have found that as much as 22% of their sample of extraordinary teachers had very limited teaching experience (under 2 years). It thus appears that at least a small percentage of individuals identified as exceptional in their field do not necessarily require extensive practice to acquire such skills. Such findings have prompted calls to conduct research which will help "disentangle the role of experience from effectiveness" (Peterson and Comeaux, 1987, p.329).

Teaching is a highly complex and dynamic cognitive activity which develops with reflective practice (Shöen, 1983). It is complex because it occurs in several phases: it involves the construction of plans prior to teaching and quick interactive decision-making in the classroom and evaluation during and after the teaching act (Leinhart & Greeno, 1986). Because of its dynamic nature, it can best be examined if it is limited to a well-defined context. The planning process

is one such context. It is a particularly important context as it operationalizes the teaching task (Peterson & Clark, 1986). Perhaps because of this importance, for the past half a century, researchers have expressed a strong interest in planning as a topic of inquiry. The outcome of investigations on planning is particularly pertinent to this research because it is an area in which qualitative differences have been found in the planning practices between experts and student teachers (Clark & Peterson, 1986). In the next section, the relevant literature on teachers' plans and planning in general is reviewed. As with most other areas of teaching, the literature on instructional planning is predominantly based on data from school teachers. The assumption here again is that characteristics derived from these empirical investigations can be generalized to the context of higher education.

TEACHERS' PLANNING

In their extensive review of the literature, Clark and Peterson (1986) trace the earliest investigations of teachers' planning to Tyler in the 1950's. Tyler (1950) conceptualized teachers' planning practices as a linear activity which progressed from specifying objectives to stating learning activities and the organization of these activities, to evaluating learning. Two decades later, Taylor (1970) revised this model and added to it pupil needs and subject matter knowledge. The validity of Tylor's (1970) model was questioned shortly thereafter. In a survey of 194 teachers, Zahorik (1975) found that teachers made

their planning decisions primarily based on content and subject matter rather than by learning objectives or pupil needs. This finding was replicated in a simulated teaching setting (Peterson & Clark, 1978). These and other research findings were drawn upon to reject the notion that teachers' planning decisions is linear (Clark & Yinger, 1979; Zahorik, 1975) and to espouse the view that planning can be characterized as a cyclical process of constant revisions in response to changing demands. The following sections review the planning literature as it relates to experience and practice.

Researchers have found that a great deal of variability exists among teachers' planning practices and this appears to be directly related both to the amount of teaching experience as well as the degree of subject matter knowledge. More experience has also been associated with plans with lesser degree of detail. For instance, the description of specific classroom behaviour has been found to be less detailed in experienced than in novice teachers' plans (Clark & Peterson, 1986; Clark & Yinger, 1979; Sardo, 1982). Moreover, researchers (Clark & Yinger, 1979; Sardo, 1982) have identified less experienced teachers as being incremental planners and the more experienced ones as comprehensive planners. The former group plans each lesson step by step with detail while the latter group establishes general guidelines for the entire week. With probing, these experienced teachers' sketchy plans unfold to reveal extensive mental plans (Livingston & Borko, 1989) suggesting that for experienced teachers, planning is a nested process, wherein plans that have been written are merely used as memory

cues (Morine-Dershimer, 1979).

The less experienced incremental planners appear to follow a more linear model of planning "à la Tyler", which starts with specifying learning objectives and which ends with determining the evaluation methods. This type of detailed planning has been associated with some degree of insensitivity to pupil needs and ideas (Byra, 1992; Zahorik, 1970) as well as lower student achievement scores (Peterson & Clark, 1978). In contrast, adaptation of plans to pupil needs or flexibility of plan implementation in the classroom has been found to be a characteristic of the more experienced pedagogues (Westerman, 1991). Thus, there appears to be no prototypical pattern of planning. Rather, planning can more accurately be conceptualized as a cyclical and recursive process where each planning episode is influenced by prior ones (Clark & Yinger, 1979; Peterson et al., 1978) and where general sketchy plans are modified as a result of interactive teaching.

Detailed planning has also been found to diminish with increased familiarity with a content area (Peterson, 1988; Peterson et al., 1979). Interestingly, increased subject matter knowledge of teachers has also been associated with better student outcomes (Evertson, Hawley & Zlotnik, 1985). It thus appears that with increased knowledge and practice, teachers have little need for detailed plans, but are, nonetheless, more effective pedagogues. Research has revealed other characteristics of the planning process of more experienced teachers. Leinhardt and colleagues (Leinhardt et al., 1987) carefully examined the

teaching plans of experienced teachers and found that their sample of teachers utilized a large repertoire of routines, a series of carefully scripted behaviours that are known by the teacher and the students. These routines allowed teachers to carry out simple classroom activities quickly and effectively.

Investigation of teachers' planning has been challenging since planning is both a psychological process wherein teachers envision a sequence of future events, and a practical activity which teachers usually engage in prior to interactive teaching (Clark & Peterson, 1986). In other complex cognitive domains, traditionally, two investigative approaches have been applied to the study of planning. Researchers have either adopted a top-down hierarchical perspective which assumes a successive refinement of planning decisions from an abstract to more concrete levels (Sacerdoti, 1974), or a bottom-up opportunistic viewpoint which proposes that interim decisions can lead to subsequent decisions at arbitrary points in the planning process (Hayes-Roth & Hayes-Roth, 1979). A large portion of the research on instructional planning has adopted a more hierarchical investigative methodology by focusing on the activities involved in planning (e.g., Peterson & Clark, 1978). Nonetheless, planning is not just a series of activities but a process of formulations and reformulations of plans and alternative subplans. For meaningful research to result, instructional planning needs to be investigated as an entire process, including all preparatory activities, construction of mental plans and subplans as well as the implementation of these plans.

RATIONALE OF PRESENT STUDY

The literature review pointed to theoretical and empirical sources for identifying indices of expertise in the domain of teaching. From teachers' use of teaching techniques, inferences can be made about teachers' knowledge structures -subject matter and pedagogical-. The examination of the protocols of interviews with teachers can provide a profile of their espoused belief system about teaching and the instructional process. In addition to these theoretically-driven indices of skilled competency, the literature also provides somewhat specific features of experts' instructional plans. These include a nested process wherein experts' plans are briefer but unfold with probing to include such sophisticated attributes as routines and knowledge integration. Experts' plans are typically more concerned with instructional technique than content and are characterized by flexibility with regards to implementation.

Above all, however, teaching expertise, not unlike expertise in other fields, is highly contextualized (Greeno, 1989) and is illustrated by adaptability to individual situations. Since no prototypical pattern of expert planning exists, identifying expertise will require careful qualitative examination of individual teachers' plans.

The present investigation addressed these issues. Specifically, it attempted to: 1) apply theoretically and empirically driven indices of pedagogical expertise to university professors' planning and teaching practices to determine whether these indices differentiated between experienced and inexperienced professors;

and 2) determine the extent to which characteristics of experienced professors overlap with those of experts in general. Not unlike other researchers in this area (e.g., Burns & Lash, 1988; Carter et al., 1987; Westerman, 1991), the present investigator chose to adopt a descriptive in-depth mode of analysis, in an attempt to better capture the trends and patterns in the data. This choice was further warranted by the exploratory nature of the research.

METHODOLOGY

Subjects

Eleven professors of a large Canadian research university, representing three faculties, Engineering (n=2), Arts (n=5) and Education (n=4), voluntarily participated in this study. All subjects were selected through the university list of courses being offered during the Spring and Summer sessions of 1993. Professors were contacted by letter (Appendix A) requesting their participation, outlining the purpose of the study, the procedure of data collection and time commitment. Follow-up phone calls were also made, resulting in a return rate of 22 percent. Since expertise has been characterized in the literature as context-specific (e.g., Greeno, 1989; Berliner, 1987, Posner, 1988), teaching experience was operationalized as the number of times a professor had taught a specific course. Professors' teaching experience ranged uniformally from the 1st to the 20th time they had taught that course. Participation was voluntary and subjects were treated in accordance with the "Ethical Principles of Psychologists" (American Psychological Association, 1981).

Procedure

An initial semi-structured interview was set up to inform participants of their task and to obtain demographic data and information about their respective courses (for questions see Appendix B). At this time, subjects were requested to keep a log of all the activities they engaged in during the preparation of an upcoming lecture of their choice. They were, however, advised to choose a

lecture which would most typically represent their instructional style. Following the presentation of their lecture, a second meeting was set up and during this meeting, subjects signed a consent form (Appendix C), agreeing to participate in a retrospective interview which would be audio-taped.

Equipment

A Sony (model WM-D3) cassette recorder and separate microphone were used to record the interview. The administrator and participant sat in close proximity to the tape recorder. A Sanyo (model TRC 9100) transcribing machine was used to transcribe all verbal data.

Data Sources

Log.

Subjects were requested to keep a log of all the activities they engaged in during the planning period of a particular upcoming lecture of the course in question. The task consisted of listing the activities that occupied their lecture preparation period as well as the proportion of time spent on each activity. Apart from providing this information, logs mainly formed the starting point of the interview and allowed professors to elaborate on their lecture.

Retrospective interview.

After the delivery of their lecture, a retrospective interview (for questions see Appendix B) was conducted with participants. This interview was designed to serve two objectives: a) to unload and expand the log in terms of instructional purpose, pedagogical reasoning and content organization, and b) to retrace the

events of the lecture in order to examine implementation and/or flexibility of plans during the instructional period.

Supporting documents.

Whenever available, supporting documents were collected from subjects. These included teachers' written notes, copies of transparencies used, class handouts and/or course outlines.

Data Coding

Logs and verbatim transcriptions of the retrospective interviews constituted the main source of data. Logs provided information on subjects' planning activities and the time dedicated to these activities. The encoding process of the transcription of the interviews involved several successive steps. Protocols were first segmented by separating each expressed idea, a practice which places emphasis on the actual content of the verbalizations (Ericsson & Simon, 1984). Data were then coded twice, once using a data-driven scheme and the second time a theoretically-driven scheme. Data-driven coding categories were derived from an initial examination of the protocols. Theoretically-driven coding categories were derived from the literature review. The two coding schemes - data-driven and theoretically-driven- were then combined to yield the final coding categories (see Appendix D) which was used to encode the data for a third and final time. Using this system, two independent judges coded the data. Inter-rater reliability was established at 85 percent.

Data Analysis

For purposes of data analysis, subjects' statements were grouped according to type of activity: planning activity, teaching action in class and reflections which included statements referring to teachers' beliefs. These statements were reproduced in two grids (see Appendix E). The first was designed to analyze teachers' planning activities while the second combined teaching actions and teacher reflections. The columns of the grids represented the coding categories (as derived from Appendix D) relevant to the type of activity (planning activity, teaching action or reflection), while the rows represented the list of subjects in the order of teaching experience. Using these grids (see Appendix E), the presence and frequency of the coding categories were noted for each protocol. This procedure helped establish whether any of the expert characteristics as derived from the literature review were present in the protocols. The grids were subsequently used for conducting a summative analysis of the protocols. Subjects' verbalizations were also content analyzed for a more in-depth examination of the invoked cognitive processes.

RESULTS

The following sections describe the prominent patterns of behaviour and characteristics as exhibited by professors with varying degrees of experience. The range of experience in the subject pool varied from professors who were assigned to teach the course for the first time to those who were teaching the course for the 30th time. Although professors were not grouped initially, examination of the data clearly distinguished similarities and differences in two groups of professors: those with 8 to 30 years of experience ($\underline{n}$=4), from here on the experienced group; and those with 1 to 4 years of experience ($\underline{n}$=5), from here on the inexperienced group. Although experience was operationalized as the number of years an instructor *taught* the particular course in question, it became evident during data inspection (refer to Table 1) that two professors with limited course experience (6 and 1 years) but with extensive general professorial experience (19 and 25 years, respectively) were more similar to the experienced group. The data relating to these two individuals were examined in the context of the experienced group. Findings will be discussed in relation to these two groups. For identification of subjects, professors were assigned a number reflective of their experience relative to each other (see Table 1). Numbers 1 to 5 represent the inexperienced group while numbers 6 to 11 refer to experienced professors. In the following sections, these numbers will be used to help identify subjects.

The logs that professors were asked to keep during their preparation time provided demographic information about subjects' occupation during planning.

Table 1

Professors' Demographic Information

Subject number	Title	Degree obtained	Faculty	Experience with course	General experience
1	Lecturer progress	PhD. in	Arts	1	1
2	Lecturer	PhD. in progress	Arts	1	2
3	Lecturer	PhD. in progress	Arts	1	1
4	Lecturer	PhD. in progress	Arts	3	3
5	Professor	PhD.	Arts	4	7
6	Lecturer	M.A.	Education	6	19
7	Professor	PhD.	Education	8	8
8	Professor	PhD.	Education	10	23
9	Professor	PhD.	Engineering	10	10
10	Professor	PhD.	Engineering	30	30
11	Professor	PhD	Education	1	25

Note Values for general experience are expressed in years.
Values for experience with course represent number of times professors taught the course.

Table 2 depicts professors' activities during instructional planning of one lecture and illustrates the proportion of planning time each professor spent on each activity. As well, Table 2 includes information about each professor's proportion of preparation time as a function of lecture duration (planning time÷lecture duration). Much variability characterized professors' preparation time. Some professors spent as much as three and half times the equivalent of their lecture time planning whereas others spent as little as half of the equivalent lecture duration planning. This variability could not be associated with experience or the lack of it. With regard to the other preparatory activities, experienced and inexperienced professors engaged in much the same activities during the planning period, however there was variability only in terms of the proportion of total planning time spent on planning activities. No other differentiating patterns between the groups were discernable.

Using expert characteristics outlined in the literature as a framework (see Grid #2 in Appendix E), important differences between the teaching and thinking practices of experienced and inexperienced professors emerged. The most notable of these differences involved: (1) automaticity of activities, (2) teaching a lecture as part of the global task of teaching, (3) knowledge integration, (4) flexibility of plan implementation, (5) use of planning notes, (6) time management, and (7) reflection. Upon closer examination of the data, important similarities between the experienced and inexperienced group were also revealed. These differences and similarities will be described in the following sections.

Table 2

Professors' planning activities and proportion of planning time spent on each activity

Subjects	1	2	3	4	5	6	7	8	9	10	11
Proportion of total planning time	1 67	1 25	2.29	0.80	0.40	1 28	0.40	1.73	3.5	0.83	0.42
Mechanical Activities			36			.13					
Reading Textbook	.30	.80	.21	.21		.25		.48			.20
Reviewing Lecture notes				.38	.50		.25			.20	53
Abbreviating Lecture notes		.10					.10	.10			10
Modifying Lecture notes										.60	
Assessing Student Needs	20							.35	.86		
Choosing Material					.50	.13					
Preparing Reading Guides			.22			.27					
Organization	35		.16	.42					.14		.07
Revising prior to teaching	15	.10	04			.22	65	.08		.20	10

Note Values represent subjects' proportion of total planning time spent on each activity
Proportion of planning refers to professors' planning time as a function of lecture duration (planning time÷lecture duration)

Differentiating Patterns Between Groups

Automaticity of activities.

Automaticity of activities, as used here, refers to actions performed by teachers on a regular basis, more or less in an unvarying and customary fashion. This trait emerged as a characteristic feature of the experienced group. This group of professors performed both preparatory activities before the lectures as well as their teaching in the classroom as a routine. Most experienced professors, for instance, used the same lecture notes from year to year, with only minor revisions. Such automaticity of the teaching task is well illustrated by statements such as "*it gets to be very routine after a while*" (**subject 10**) or "*I have done it so many times, I can put the overhead on at the right time*" (**subject 7**).

Other statements from experienced professors follow:

subject 6 *It's a kind of routine that takes on its own ...life, yes.*

subject 9 *I had lectured on the subject years past [and] of course I didn't prepare lecture notes or anything [...] but I was using notes from previous years.*

subject 11 *That's why I spend a fair amount of time reviewing the material so that it's at my fingertip so that I can use my own language.*

Inexperienced professors, on the other hand, described the specific actions they performed for the planning of this particular lecture. They rarely mentioned any routine for their planning. The following statements illustrate how these professors engaged in deliberate, distinctive actions for the specific lecture in question:

subject 1 *For every author we studied, I wrote down all the main types of arguments as a resume [...]. So I did a sort of revision of everything they have been doing up until now and I systematized the material*

subject 2 *I was planning to go over the take home exam and go over the question and tell them how I wanted them to answer the question.*

subject 3 *So initially I planned to start with that and then I realized that really the other things I wanted to cover on syntax should come before it, it would make more sense to do the review at the end of the syntax part.*

subject 4 *[I'm] deciding on which overheads I will use, which ones I won't use.*

When conducting a lecture, experienced professors, always provided students with an overview of lecture topics, a summary of the previous lecture and concrete examples at appropriate times. The spontaneity of this practice is well illustrated in the following statements:

subject 7 *Usually when I come into class, I spend a couple of minutes telling them this is what I have covered so far and this is where we left off last day and I just recap very briefly and say this is what I want to cover today [...] and these are the other activities that are going to be involved in our class today.*

subject 8 *We always recap the next day what we've done the day before and some point in how I would know everybody is here [...] that's when I give my instructions to things and so on, I take 2 to 3 minutes. to make announcements, reflections.*

subject 9 *What I sometimes do in summary, I have material left over from the previous lecture, finish that out at the beginning in the next lecture.*

subject 11 ***Often*** *we spend time in the morning talking about their reactions to things, questions they might've brought from the afternoon before and picking on points that were unclear or what have you, so that becomes the starting point.*

The data also provided evidence that inexperienced professors built their lecture around a few specific examples, whereas experienced instructors incorporated examples into their lecture in a more spontaneous and habitual way. The following excerpts from experienced professors illustrate this phenomenon:

subject 6 *I give them anecdotes, I give them possibilities.*

subject 7 *I draw on personal relationships to make analogies to some of the things that are being discussed in the class.*

subject 8 *It's the experience that comes with the course that I have so much of that I can tell stories and anecdotes, examples they come very easily.*

subject 9 *I was going over material that had been covered to see if there were ways that I could tie things together, integrate, give examples.*

subject 11 ***Usually*** *in terms of the kinds of examples I might talk about, I usually do.* ***Sometimes*** *I'll scribble down couple of words just to remind myself of an example but other times, they'll occur to me based on questions that students raise or something just pops into mind.*

Compare the above statements with the following ones from inexperienced professors which depict their use of deliberately planned examples:

subject 1 *And I gave an example again for Plato, for Descartes and Kant.*

subject 2 *When I was discussing monopoly of church over knowledge, I came to how the bar against women's entry into medical science was exercised and then I talked about my grandmother's aunt who was practising medicine while she was pinned to seclusion.*

subject 3 *... so I had to discuss that idea of deep and surface structure in more detail so I put some example sentences.*

subject 4 *[I used] an example, smoking, everyone knows that smoking probably shortens your life but if you enjoy smoking, you'll worry about increasing your happiness tonight, you won't worry about its effect on your life.*

subject 5 *I had quite a few examples and I just showed that.*

Routines

Automaticity of activities also involves the implementation of routines, which are carefully scripted behaviours that are known by both the teacher and the students, and allow simple classroom activities to be carried out quickly and effectively. These can either be instructional or managerial in nature. Only experienced professors exhibited such practices in their classrooms. The following excerpts are examples of *management* routines used by experienced professors to form discussion groups:

subject 6 *Relationships are set and I know people's names [...] and we dispense with the hi how are you, it's A is over there, B is over there, C is over there, except I don't even need to say that anymore: people go into the first of their small groups.*

subject 8 *And that to me is all part of the management that you have before, ensures success and doesn't waste time, you know. You just say ok, Maria, Nadia and Gary get into this group please and I tell them I am going to form the groups today because I have an agenda.*

The next excerpts represent *instructional* routines which were only displayed by experienced professors:

subject 7 *Usually to give myself a cue up, I put the first overhead up and then it's up and I know to go back to the overhead.*

subject 8 *And I often do that when I know that I am giving them a lot of new information whicl: sometimes one cannot always relate with from experience, then I will do a synthesis together at the end and say ok, we've talked about this, and this and this today, are there any questions or queries about this, is it clear on this.*

subject 10 *I went in, I turned on this machine and then put the first slide. Told them they were going to talk about huge change of trains and this was part 3 of the series and then the heat power integration and proceeded to go through the slides, one at a time show them and discuss them.*

subject 11 *Often we spend time in the morning talking about their reactions to things, questions they might have...*

Reference to such routines were absent in the protocols of the inexperienced group.

Teaching a lecture as part of the global task of teaching

Teaching a lecture as part of the global task of teaching, as used here, refers to professors' inability to talk about one particular lecture in isolation. This category emerged as a difference between the experienced and the inexperienced group during the second round of analysis. During the retrospective interview, it became apparent that the experienced professors were unable to talk only about the lecture in question even though the interview questions were all geared toward this specific lecture. These professors would consistently discuss the

typical course of events and speak of this lecture in the context of what usually takes place, despite interviewer's attempts to bring the discussion back to the particular lecture in question. This characteristic feature of experienced professors' protocols is well illustrated by the frequent use of words such as **usually**, **always**, **sometimes** or **often** (see afore-mentioned excerpts of experienced professors). One professor described how he conceived of lectures within the larger context of a course by stating that:

subject 11 *It's all sort of interconnected, that one thing doesn't dovetail, C immediately following B sort of thing, it's more cyclical in a sense, if you want.*

Less experienced professors, however, elaborated specifically on their planning activities prior to the lecture in question and traced the events of the specific lecture, without difficulty.

Knowledge integration

Other teaching processes which differentiated the experienced from the inexperienced professors included the way professors helped students integrate the material. Although all professors placed new learning in the context of students' prior knowledge, the distinctive feature of the experienced group was that, typically, these professors integrated information discussed in several lectures to enable students to formulate a more coherent conceptual knowledge structure of their own. This characteristic is well depicted in the following excerpts:

subject 6 *An anecdote which hopefully makes things more concrete so it's easier to hook into other hooks that they have in their network of memories.*

subject 7 *If you can see the practical everyday things happening, like I talked about people who are always depressed and anxious, that they were prone to suicide and violent death [...]. All that putting it in perspective how if you don't have very good health that you are prone to some negative behaviours or physical disease.*

subject 8 *So I used the same kinds of strategies and techniques with them as they would use with their students. So as I teach I try to incorporate the same techniques that they should be incorporating in their teaching at different levels of ESL.*

subject 9 *Looking at fibre lengths from lecture number 2, statistical geometry from lecture number 3, the optical properties from lectures 5 and 6.*

subject 11 *So virtually everyday we tried to do something which was to enhance their critical skills.*

On the other hand, inexperienced professors would typically review only the previous lecture, linking the latter to the current topic as is depicted in the following excerpts:

subject 1 *So I did a sort of revision of everything they have been doing up until now.*

subject 2 *I proceeded to the discussion of **yesterday**'s movie and I picked the main theme which was power and social control and I linked yesterday's lecture which was on a completely different topic to today's lecture which was education.*

subject 3 *Yes, it was repeating, summarizing what I had said **yesterday**, again organizing it again so it would make sense.*

subject 4 *I reiterated from the **previous section**, the two topics in this section. Basically, one is on irregulation and the other is on dynamic inconsistencies. I linked the two together.*

subject 5 *There were two examples of a landscape artist that I meant to show and I just showed them quickly and used that to review what we had done* ***last time.***

Flexibility of plan implementation

All professors in the sample were sensitive to student needs and willingly abandoned their plans to accommodate for student concerns and/or questions. The aspect which distinguished the experienced from the less experienced group was the way in which these professors were able to accomplish the pre-planned objectives of the lecture within an interactive context. That is to say, the experienced professors adapted their plans to the particular needs of the students, without compromising the overriding goals of the lecture in question. The less experienced professors, on the other hand, although sensitive to student needs, tended to abandon their plans when addressing student concerns and undertake a new course of action. Consistently, the less experienced professors stated that questions from students changed their plans to the point that the material had to be covered in the next lecture:

subject 1 *So because of the discussion, I didn't do so much on this but we will do it tomorrow. So I didn't cover as much as I thought.*

subject 3 *One of the students raised a question So I went into a sidetrack on methodology [...] today's lecture ended up taking longer than I thought because they were those 2 methodology and the maturation digressions.*

subject 4 *These questions and the extra comments that were made [...] changed the material that I covered. I didn't cover as much as I wanted to. I couldn't finish off the section that I had started already in the previous Wed. and I didn't get off to the new topic that I wanted to cover.*

subject 5 *A few more artists, I didn't get to the next one here. On Monday I would continue, starting with the same point and showing variations of that same aspects in other artists.*

One inexperienced professor did manage to achieve her pre-planned goals for the lecture. She, however, did not entertain any questions from the students and did not appear to have a flexible mode of teaching:

subject 2 *I just followed what I was going to say, there wasn't much question because the material was rather heavy and one of the presenters was absent so I was just ready for the amount of time that I was supposed to and that was ok.*

Compare the statements from the inexperienced group with the following excerpts from experienced professors who often entertained questions from students which made them digress from their plans, yet they still managed to reach their pre-planned objectives:

subject 6 *There's a lot of room for student concerns and for elucidation if somebody doesn't understand what one of those points is [...] because it's not that planned of a presentation. So I got my points in and that's my bottom line and the rest of it happens as it happens.*

subject 7 *They are **always** asking questions that are related to the point but sort of gets you off on a tangent. That often happens [...but] I am not under any time pressure to get through the material. I don't find that that's a problem. In fact, I have had plenty of time to do everything I wanted to do.*

subject 8 *However, it didn't work out that way. We got sidetracked [...] because they had read the stuff that I had given them and now they wanted some more discussion [...]. So what I did [is] I had 6 items that I hadn't covered and I said I can't do it in that time. So I had to change my system all together and I said I'm going to work with what I call learning cells [...] so I didn't have to lecture at all. And I could do all of that in the same time. In the hour half that we had, I was able to cover 3 hours of work.*

subject 9 *I had originally planned to allow myself 45 minutes to half an hour at the end to discuss some of these different aspects of bonding. I ended up with half an hour instead of 45 minutes, it was within the parameters.*

subject 11 *Yes, well if I hadn't [covered everything] well then I probably would've varied the routine after coffee break to some extent.*

<u>Use of planning notes</u>

Although both groups of professors used written notes for their lectures, for the experienced professors, these notes simply represented brief outlines which would unfold to reveal extensive elaborations. Moreover, the extent to which notes were relied upon varied greatly between the experienced and the inexperienced group. This is well illustrated by the following excerpts:

subject 6 *I limit the central stuff to stuff that probably I could fit on one page in note-form, deliver in 5 minutes. straight lecture.*

subject 7 *I find that more and more the notes are there just, they're just a crutch, because I know the stuff off the top of my head.*

subject 8 *And I hardly follow my notes when I'm lecturing to them, at some point I look and I say yes, I said this, this, this, ok., fine I'm good, you know as a check for me but I don't sort of follow my notes and talk, I have it there and sometimes it's still on page 1 and I'm on page 3 of the notes that I've done and so I take a moment to check to make sure this is all said ok, fine.*

subject 9 *Well, various doodles here and there but just trying to put together.*

subject 10 *I have this set of notes and so I have essentially designed them so that I have these things which are diagrams, which serve basically as an aide memoire to me to tell them the story.*

subject 11 *I might write myself a handful of very abbreviated sentences or something on a card just to remind myself point A B C. I mean these little hand scribbles I go by [...] takes up to two hours.*

Compare the above statements with the following from the inexperienced group of professors who either rely more heavily on their written class notes or because of unfamiliarity with the material, have a tendency to digress from them:

subject 1 *I just wrote some sketches, patterns of the argument that we've done [...] And then this morning, I just revised the schedule, went back to the notes see what I should do.*

subject 2 *I had notes and I wrote them on the board. [...] I use notes although I find it hard to stick to my notes because I tend to wander.*

subject 3 *I reread my notes just when I come into class waiting for the students to arrive, I just sort of flip through them to make sure that I from the notes get all the major things that I wanted to cover.*

subject 4 *I would have notes with blackboard material and put the material in order. I number them, I go A, B, C, D. I organize it to begin with and then put the components together.*

subject 5 *It's impossible to remember all the dates and where these things are, the precise titles and everything. So I pretty much read this section here, the section that I wrote in block letters. I read this and then I can talk about the rest because I remember it.*

Time management

Important differences also emerged between the two groups of professors with regards to time management. The fact that inexperienced professors had difficulty estimating time allotment for various planned activities will surprise no one. Of special interest, however, is the way in which experienced professors achieved successful time management. As is illustrated in the following excerpt, half of the sample of experienced professors visualized how the class would proceed and were thus able to successfully estimate time allotment to various activities/topics:

subject 7 *It's sort of like a mock presentation in a way in my mind. Going through all the stuff and making sure, ok. this is how I am going to present this.*

subject 8 *I put them down on paper, I visualize and then I throw the thing out [...] but I always try to put it on paper so I see. To me it's part of planning, is the management of my course, so the time line management.*

subject 11 *Trying to follow through that routine, seeing how difficult it was or how easy it was to follow.*

Other experienced professors either intuitively knew how to effectively pace their instruction, or made use of a pre-determined outline to structure lectures (such as reading guide questions). These two practices are illustrated in the following excerpts, respectively:

subject 6 *The general outline is already there, I had thought about that previously.*

subject 9 *I was correct in assessing that 45 minutes that was left for bonding was enough to cover it, even to throw around a little bit of humour.*

Compare with the following excerpts from inexperienced professors:

subject 1 *Yes, that was about the last hour. I was planning to go on originally for one hour and a half.*

subject 3 *So I was planning on getting that far today but as it turned out, it took a bit longer to say the things that I had expected.*

subject 4 *So the whole thing as I recall it in my watch took one hour and 20 minutes. Which is way longer than I hoped it would take.*

subject 5 *The first time the course is given, it tells me just mechanically how long it takes to cover a certain amount. And the first time the course is given afterwards I review how reasonable it was... whether I did get as far as I intended to go. Whether I should include certain or should include other artists. So the first proper time the course is actually given is the second time. The first one is like a trial one.*

Reflections

Although both groups of teachers reflected upon their teaching during the interview, the experienced group made some immediate revisions as a result of reflection which in Shulman's (1987) words, exemplifies new comprehension. In contrast, the less experienced professors appeared not to be adept enough to change their teaching quickly. This phenomenon is illustrated in the statements from experienced instructors:

subject 6 *And then when I get to my set of materials that shifts things off a bit and things are continuing to percolate inside so when the time actually comes to pack, I may have changed my mind about what I can afford to leave out.*

subject 7 *Those were notes that I think the first time I had done it I didn't really spend enough time, I didn't emphasize it enough, so then when I went back, I said well, you have to add that in your lecture, make sure you cover that because you didn't do it last time.*

subject 8 *I gave myself this extra job ... why don't I do this better, instead of just talking from the top of my head, let me make myself my own notes from it and then I could see where the notes went, the information that I zeroed in on from the papers.*

subject 10 *I realized that I could make a better presentation after I finished reading them. That I could do a slightly better job [...] I decided I could do more, and I could show the temperatures on it.*

Compare with the following excerpts from inexperienced professors who seemed to first contemplate revising their behaviour at a later time, if at all:

subject 1 *Then I realized that I could use, I could do a revision of the aims of the course and of what we have been doing up to that time in order to explain them why I think that was their mistakes and those [arguments] were not relevant.*

subject 2 *Now if I do it again I am going to demand everybody to do the reading before they come to the class. I didn't make a very great point about that but I will do it next time that I teach.*

subject 3 *I realized from yesterday that I presented a bunch of different theories but didn't make it clear exactly how they all related to each other and I felt that I overwhelmed the students with so much information but didn't organize it in a way that was digestible for them enough that I was comfortable with, so I wanted to start out by reviewing what we had done yesterday.*

subject 4 *I am going to have to think about it if I am going to teach this course again [...] I think I will change the format and the structure of it somewhat.*

subject 5 *There was one example I showed, I was thinking of [...]. And then once they were up on the screen, they didn't make any sense at all and I got the same feedback from the students in the class. So I admitted that the choice was somewhat unfortunate. I had some other comparative examples, I rather skipped over to those then.*

The previous sections outlined differences between experienced and inexperienced professors using the expert categories derived from the literature review as a framework. The same data were examined using Ramsden's (1992) hierarchical model of teacher views. Table 3 and 4 present experienced and inexperienced professors' statements, categorized according to Ramsden's (1992) three-stage model. Statements categorized as stage 1 reflected teachers' belief that failure to learn was due to students' motivational problems. Also included in this category were statements viewing teachers as disseminators of knowledge and statements indicating a reluctance to use interactive teaching techniques. Statements classified as stage 2 mainly reflected teachers' knowledge and/or practice of various pedagogical tools (e.g., learning media, involvement of students). Stage 3 statements reflected teachers' commitment to having students

Table 3

Inexperienced Professors' Statements Reflecting Ramsden's (1992) Hierarchical Theory

Ss	Ramsden[1]	Ramsden[2]	Ramsden[3]
1	"Some of the persons who were doing those mistakes seem not to be motivated to really to make the effort of switching from one kind of understanding to another. It's not impossible to see that the problems are different. It's just that they're not motivated to shake their own customs and beliefs".	"I think that if you notice that your mistakes are given as bad examples in class, you might do more effort to correct".	
2		"The way that I taught this course was, I had a great attempt and commitment to share my power [with the students]".	
3	"What I wanted them to get out of the inflection part is sort of knowing how the research goes and I don't really know what I wanted, I hadn't really thought anything more than getting the facts"		
4	"I haven't found in economics anyway, to date where you can actually facilitate fairly complex concept learning through interactive teaching".	"It's good to have a mix between learning media. I use the overhead and I'll skip a bit on the overhead and I'll actually use an updated section on the blackboard and I'll come back to a section on the overhead, I switch".	
5		"I try to encourage interaction on the part of the students"	

Table 4

Experienced Professors' Statements Reflecting Ramsden's (1992) Hierarchical Theory

Ss	Ramsden[1]	Ramsden[2]	Ramsden[3]
6			"Mainly I see myself as a mediator. I guess I have a lot of trouble thinking of anybody as being an expert in teaching because there is no definition of that I understand about what an effective teacher is. There are lots of different methods that are effective for different people"
7		"I want them to get involved and I want them to tell me the answer".	"I want them to think about it, not just give them the answer"
8		"I don't want them to be bored [...]. For me ideally is to have three different components altogether so that we are not spending more than an hour on one idea. So that the mode of delivery, what we're dealing with adds variety to the class".	"The whole purpose of the activity was to reflect upon oneself, what am I like as a learner, who am I, how do I learn best, under what circumstances"
9		"This year is a rather quiet group, I've had other years where I've had people who were really keen on chasing rabbits but this year it was more like pulling teeth· I wasn't getting much discussion".	
10		"Just in general went over it. I'll give them a written handout which they can study rather than just go over it".	
11		"That's part of why you encourage questions because teaching is a two-way street, I tell them I could stand on my head and spin nickels by you, if they are not really interested in learning then the process stops there".	

think about, as opposed to just *know* the material. Stage 3 also included statements portraying teachers' role as a mediator/facilitator rather than a disseminator of information. Although it was impossible to categorically label individuals as corresponding to either stage 1, 2 or 3, it is evident from tables 3 and 4 that inexperienced professors were situated between stages 1 and 2, whereas experienced professors were situated between stages 2 and 3.

The differences described above were characteristic features of almost all experienced professors. There was an additional characteristic which was not shared by all. Two professors demonstrated the particularly sophisticated teaching practice of contingency planning. Contingency planning, as used here, refers to the practice of entertaining more than one set of plans for teaching activities that are contingent upon what develops in the classroom during interactive teaching. That is to say, these professors prepare for lectures by contemplating a few alternative patterns of actions, which they will undertake depending on the developments in the classroom. This is well depicted in the following excerpts:

subject 8 *I have sort of a plan A and a plan B. If I have time, if I don't have time, if I have time if I don't have time. Sometimes I get into the class and I go on to plan C because something else happens and change mon fusil d'épaule.*

subject 9 *If it turned out that students knew topics 1 and 3 very well, I would be able to expand on topics 2 and 4 [...]. The point is that I had planned for there to be contingencies [...]. If I had gone in saying this is what I'm going to talk about and if they start falling asleep, I'll skip over something [...] I was going in with alternatives, flexible enough game plan.*

As mentioned in the literature review, another potential characteristic which could distinguish experienced from inexperienced professors is the ability of experienced teachers to practice in the classroom what they advocate as effective instruction. Although this did not emerge as a differentiating characteristic between the two groups in the present sample, two inexperienced professors displayed incongruence between their usual teaching practice and their behaviour during this lecture/course. The following excerpts illustrate this phenomenon:

subject 2 *Normally I either have a transparency or I give handouts. In yesterday and today's lectures, I wasn't able to do that due to lack of time.*

subject 5 *What I do in the 19th century course, I didn't have a chance to do it for this one, is I have a copy of the slides I used [...] and put that into the audio-visual section in the library.*

subject 5 *That's what I test in class, especially in the 19th century course, I don't do it here because people are scared.*

Similarities Between Groups

The previous sections have pointed to the differentiating characteristics between the experienced and inexperienced group of professors. It is also equally important to note the many aspects the two groups share as one of the purposes of this study was to determine whether only experience brought about 'expert-like' characteristics. As mentioned earlier, both groups helped students integrate knowledge and were flexible in implementing their plans; only the level of sophistication of these practices differed across the two groups. In addition to

these similarities, all professors willingly shared power with their students as the following excerpts demonstrate:

subject 1 *I said at the beginning that if they had any questions to just come up or with comments.*

subject 2 *The extra time just went to discussions.*

subject 3 *I started by asking how they had found it.*

subject 4 *They ask a lot of questions and there are a few students who are extremely vocal.*

subject 5 *I try to encourage interaction on the part of the students.*

subject 6 *Basically, it's pretty much student-run.*

subject 7 *You know I want them to get involved.*

subject 8 *I entertain discussion.*

subject 9 *I'm just leading them and letting them come up with suggestions.*

subject 10 *They did ask a few questions about this.*

subject 11 *We looked at the piece and discussed it.*

The monitoring of student behaviour and using it as a form of feedback to evaluate one's teaching was another characteristic feature shared by all the professors. The following excerpts illustrate this practice:

subject 1 *I showed the wrong ones and they realized that we are working at a very high level.*

subject 2 *I am very aware of when they are getting bored.*

subject 3 *They showed looks of confusion that made me summarize one more time.*

subject 4 *I think they are more concerned about the exam than on much of the material.*

subject 5 *I got the same feedback from the students in the class, so I admitted the choice was somewhat unfortunate.*

subject 6 *I am very reactive too.*

subject 7 *... the students' attention span hasn't been great.*

subject 8 *Sometimes I can just see from the behaviour, from the lack of heads nodding, the frowns on the face or a blank stare that and I'll say, I guess that example does not help much, let me give you another example.*

subject 9 *It turned out that people...their body language indicated I don't want to be called on. When two thirds of the class crawls under their desks, you know there's something wrong.*

Familiarity with a broad range of pedagogical techniques is yet another common characteristic across the experienced and inexperienced professors. Table 5 illustrates professors' use of such techniques. Interestingly, this similarity was also picked up when Ramsden's (1992) theories of teaching was used as a framework to examine the data. In this framework, most professors were placed in stage 2, regardless of their experience (see Tables 3 & 4).

A final characteristic shared by both groups was pedagogical content knowledge as defined by Shulman (1986b) (refer to Table 6). Although much variability characterized the extent to which pedagogical content knowledge drove the instruction, it was evident from professors' statements that most possess this knowledge structure and refer to it for selecting material and examples or for organizing information.

Table 5

Professors' Use of Pedagogical Tools as a Function of Experience

Subject	Exp	Modes of delivery used	Modes of presentation used
1	1	lecture	board
2	1	lecture	board
3	1	lecture discussion	transparencies board handouts
4	3	lecture student presentation	transparencies board
5	4	lecture	transparencies
	6	lecture discussion student groups student presentations	handouts
7	8	lecture	transparencies
8	10	lecture discussion student groups	board handouts
9	10	lecture	board physical objects
10	30	lecture	transparencies
11	1/25	lecture discussion student groups	board handouts

Note Exp refers to experience with this course

Table 6

Professors' Statements Illustrating Pedagogical Content Knowledge

Subjects	Statements
1	I went back to the idea that we have special types of arguments in philosophy because we have special requirements, we want to explain something which cannot be backed up by just empirical arguments.
2	One of the things that I have used and I made a point of saying was that feminist critical pedagogy believes in giving voice to the minority and a feminist teacher tries to create a pedagogical situation in which people can find themselves and their experience and know that their experience is important. So I not only taught the course and the ideas and theorized, but practised through teaching and through interpersonal relations.
3	I wanted them to see an actual child language transcript that they read about in their textbook, that exoticness quality. To see they talked about this guy, they talked about the child and now they had this kid's actual words in front of them as they were working with it.
4	In economics, the most important thing, I think, is concept learning. So if I feel that the concept is going to be difficult in terms of the learning experience, then I'll think of another way to present it.
5	There's always the two parts that are important to Art history. You have to have visual recall, you have to be able to identify the works but also have the data, the information on them, what they mean and the source of the historical context and all of that.
6	There's not that much that you can say that generally applies to all of the groups. I mean special health care includes things like diabetes, cystic fibrosis, multiple sclerosis, [...] but there's not much useful you can say about all the groups. So a lot of people have no idea what a kid with cystic fibrosis would look like or how that would affect them at school, so a lot of the stuff was sensitization, give them some idea of who these kids were.
8	That's what teaching English as a Second Language (ESL) is all about with communicative language teaching and so on. So I use the same kinds of strategies and techniques with them as they would use with their students. So as I teach I try to incorporate the same techniques that they should be incorporating in their teaching at different levels of ESL.
9	I talked about the difference between the kegs in tensile where you nucleate, you have stress that is distributed elastically. It's like pulling a spring or an elastic band: energy is stored in there and then you have the spontaneous crack anywhere, that crack will propagate across and all that energy gets released and the whole thing flies apart.
10	And here's how we put them together, we had to build one with this low temperature and then one with a higher temperature and one with still a higher temperature and then finally, the highest temperature of all to bring it up. So I explained this to them which is essentially what is happening in this series of drawings here: heat pumps and cascades. This is essentially a theory and maybe the general way to do it and here I've a particular case.
11	The point was to show them that one of the very reasons why we do art is because you can't translate it absolutely in key words. So what they end up drawing is a sense of you know, intuitive and affective state based on the vocabulary that I have and that they have.

DISCUSSION

The present investigation examined the planning and teaching practices of university professors with varying degrees of experience and attempted to (a) establish the differences and similarities between experienced and inexperienced professors in planning and teaching, and (b) delineate the extent to which experience brought about expert-like characteristics. Two grids, one related to planning practices and the other to teaching and reflection, were created. The items in the grids were devised on the basis of theoretical and empirical indices of pedagogical expertise and effective teaching as reflected in the literature (e.g., Burns & Lash, 1988; Leinhardt & Smith, 1985; Shulman, 1986b), and of Ramsden's (1992) hierarchical model of teacher views. The following paragraphs discuss the findings in relation to these issues.

The first set of findings relate to the differences and similarities between experienced and inexperienced professors. The in-depth analysis of the teaching practices of professors revealed that some characteristics did differentiate the experienced from the inexperienced group. These characteristics which also have a literature base included automaticity of procedures (e.g., Berliner, 1986), presence of pedagogical routines (e.g., Leinhardt & Greeno, 1986), ability to help students integrate knowledge (e.g., Westerman, 1991), flexible plan implementation (e.g., Westerman, 1991), use of lecture notes as memory cues (Morine-Dershimer, 1979), and the presence of metacognitive reflections leading to revision of behaviour (Shöen, 1983). In this study, experienced professors (over

6 years of experience) had a more holistic approach to their teaching and placed the lecture in the context of the course, and were able to facilitate the integration of knowledge. Both their planning and their teaching processes appeared to be automatic, and they relied heavily on instructional and management routines which allowed for efficient time management. Perhaps because of this efficient use of time, unlike their less experienced colleagues, experienced professors were able to reflect and to revise their teaching on the basis of a new comprehension (Shulman, 1987). Moreover, experienced professors were flexible in adapting lecture plans to student needs without compromising original pre-planned lecture goals. Finally, their experience appeared to eliminate the need to rely extensively on lecture notes which were, instead, used as memory cues.

While experienced and inexperienced professors were different in the ways described above, they were similar in other ways, also referred to in the literature as characteristics of effective teaching. These aspects included familiarity with various pedagogical techniques (e.g., Burns & Lash, 1988), willingness to share power with the students (e.g., Burns & Lash, 1988) and regular monitoring of student behaviour as feedback for one's teaching (e.g., Westerman, 1991). A subset of the data representing two experienced professors with average experience (10 years) exhibited particularly sophisticated pedagogical processes such as the routine practice of contingency planning. Perhaps these unique individuals are the ones described by Sternberg (1989) as the significant contributors to their field because they are neither too experienced to be

entrenched in old ways of thinking nor too inexperienced to lack the skills and knowledge to adapt to a new approach.

In conclusion, in so far as the differences between experienced and inexperienced professors are concerned, the findings seem to suggest that pedagogical experience, particularly experience in teaching one course, appears to have some impact on bringing about more characteristics which are associated with effective teaching and hence, pedagogical expertise. However, other characteristics of effective teaching and expertise in general seem to be present regardless of experience. As the data show, there were a number of similarities between experienced and inexperienced professors in some of these characteristics, namely familiarity with pedagogical tools, willingness to share power with the students and monitoring of student behaviour. The display of sophisticated planning by only a subgroup of experienced professors further suggests that factors other than mere experience contribute to the development of pedagogical expertise, since the latter was not manifested in the planning practice of participants in this study.

The second set of findings relate to the degree of congruence between characteristics of professors and those of experts in general. Extensive research has demonstrated that expert characteristics in various problem-solving fields also apply to the domain of secondary school teaching (e.g., Berliner, 1986; Leinhardt et al., 1987; Shoenfeld & Hermann, 1982; Solomon & Lee, 1991). For instance, automaticity is a well-researched feature of expertise in general (e.g., Glaser,

1984; Glaser & Chi, 1988; Posner, 1988) and in expertise in secondary school teaching in particular (Carter et al., 1987; 1988; Livingston & Borko, 1989; Swanson et al., 1990). The present investigation afforded the possibility to examine the extent to which findings related to general expertise and pedagogical expertise in school teaching applied to the domain of higher education.

Results of the present study suggest that some expert characteristics articulated in the literature which have been associated with pedagogical expertise in secondary school teaching are also evidenced in experienced professors. However, the results also indicate that some of these characteristics are present in inexperienced professors as well. Similar to experts in other fields, all professors (experienced and inexperienced) appeared to have a principled representation of their knowledge domain (Posner, 1988) as evidenced by their ability to help students integrate knowledge and the way these principles guided lecture presentations (otherwise defined as pedagogical content knowledge). Moreover, all professors displayed good self-monitoring skills (Glaser & Chi, 1988; Posner, 1988) by using student behaviour as feedback for teaching and showing willingness to adapt their teaching to student concerns. It thus appears that, in the context of higher education, the "novice", as defined in the expert-novice literature, does not exist. Both experienced and inexperienced university professors do engage in at least some processes that are expert-like. One explanation might be that subject matter expertise which characterizes all university professors, may be having an effect on the level of pedagogical expertise.

This assertion can be further supported by other evidence from the literature on secondary school teachers that suggests increased subject matter knowledge is associated with less detailed planning (Peterson, 1988; Peterson et al., 1979), more flexible plan implementation (Westerman, 1991) and more sensitivity to pupil needs (Evertson et al., 1985). The sample included in this study, displayed all of these characteristics, suggesting that there might be more general traits in expertise that cross over disciplines. Thus, with regard to the specific relationship between experience and expertise, it could be cautiously suggested that in post-secondary teaching, pedagogical expertise does not necessarily evolve due to experience.

A third though indirect outcome of this study was brought about by the way the coding grids were generated and used. The three teacher cognition theories which contributed to the coding scheme stemmed from very disparate backgrounds. Shulman's (1986b) and Leinhardt & Smith's (1985) theories of teachers' knowledge structures represented conceptualizations of effective teachers in the context of secondary education. Ramsden's (1992) hierarchical theories represented the developmental stages of the post-secondary educator's beliefs and practices. Content analysis of the data on the basis of these theories yielded interesting findings, not the least of which was the compatibility and the applicability of theories supporting school teaching and the theory representing university teaching.

The components of Shulman (1986b) and Leinhardt and Smith's (1985)

theories of teacher knowledge structures revealed few differentiating characteristics between inexperienced and experienced professors . In the content knowledge component, this was expected since all professors, by definition, possess domain knowledge. With regard to pedagogical content knowledge, no differences were revealed between inexperienced and experienced instructors: Both groups utilized this knowledge to guide their instruction. The careful examination of teachers' pedagogical knowledge did, however, reveal some qualitative differences. Although all professors displayed extensive familiarity with various pedagogical techniques, the experienced professors appeared to have automatized many aspects of their task and had a holistic and more global impression of the task of teaching a lecture.

Using the components of Ramsden's (1992) theories revealed some differences between the experienced and inexperienced professors. Although all professors reflected upon their teaching, only the experienced professors made any attempts to revise the way they approached teaching the subject at hand. Moreover, this framework placed the experienced professors at a more evolved stage than their less experienced colleagues. Interestingly, Ramsden's (1992) theory of higher education does somewhat resemble Shulman's (1987) processes of reflection and new comprehension involved in pedagogical reasoning, but neither framework is comprehensive enough to fully capture the underlying cognitive processes of the post-secondary educator.

The findings of the present study have a number of implications for

improving the quality of university teaching and learning. Faculty development programs are needed to specifically increase pedagogical knowledge of professors at all levels of experience. The results of this study also suggest that the literature on school teaching and the expert-novice paradigm do not fully differentiate between more effective and less effective professors. Pedagogues at the university level appear to be uniquely different in some fundamental ways from school teachers. Moreover, they are different from experts and novices in other problem-solving domains, since the characteristics that define the "novices" in general seem to be absent in the context of higher education. More research in the domain of higher education is needed to better understand the distinctiveness of the post-secondary educator's cognitive processes and to generate more comprehensive paradigms designed to accurately describe these processes. Only then, can administrators apply principles derived from higher education, to design programs and policies for improving the quality of university education.

Despite the potentially significant implications of the present investigation, the generalizability of the findings are somewhat limited by the exploratory nature of the project and the limited number of subjects included in the study. Further research, particularly developmental studies can help articulate a theory of pedagogical expertise highlighting the cognitive processes of planning, teaching and reflection. Empirical investigations of Ramsden's (1992) and Shulman's (1986b) theories are also needed to further assess the applicability of these theories to the in-depth study of the teaching processes.

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Appendix A

Contact Letter

Name of professor,
Name of Department professor is affiliated to,
Name of Faculty,
McGill University,

Name of participant,

I am a graduate student in the department of Educational Psychology at McGill University. As a member of the Centre for University Teaching and Learning, I am presently conducting my master's thesis under Dr. Alenoush Saroyan's supervision. The thesis project is examining the relationship between professors' teaching experience and their planning practices. The general purpose of the present study is to determine if and how professors with varying degrees of experience differ in their planning practices. Practice and experience are considered to be major factors in the development of expertise in any domain and I am interested in investigating this notion in the domain of teaching.

I would very much appreciate it if you would participate in my study. The project entails two phases of data collection. The first of these will require you to keep a log of the activities that you engage in during the planning period of one lecture. This will not take you any more time than you would normally devote to your planning. A sample log with examples of planning activities will be provided for your convenience. I would also appreciate getting a copy of any written plans that were drawn up during planning of the lecture, such as lecture notes.

In the second phase of data collection which will take place after you have conducted your lecture, I would appreciate it if you would allow me to meet with you for an interview in which I will ask you to go over your log and/or written plans and explain whether or not you adhered to your plans. This interview will take less than one hour of your time.

With your permission, I will contact you on Thursday June 10th, 1993 to set up a meeting time with you. If you are unavailable at this time, please contact me at 938-1026 or 398-8063 (McGill).

Thank you in advance for your participation,

Marie-Josée Gendron

Appendix B

Interview Questions

BEFORE LOG:

- Please describe the course/the main topic?
- Do you ask for any student demographic information at begin.?
- How does, if at all, this change your curriculum?
- How long/many times have you taught this particular course?
- How has the course changed/developed over the years, if at all?
- Where does teaching rank in your priorities as a professor?
- How long have you been teaching?
- How/where did you learn how to teach?
- Have you attended any kind of teaching workshops?

LOG: • Please list all activities (physical/cognitive: brainstorming/discussing) that you engaged in during time set aside for the planning for one specific lecture.
• Also list proportion of time spent on each activity.

INTERVIEW:

• Explain the activities for me (e.g., you say here that you engaged in reading, what did you read?)
(e.g., you say here that you reviewed your old lecture notes from previous years, did you cover exactly the same material?)
• How much did you plan to cover in this lecture? What topics?
• How were you planning on going about it? What format were you going to use? Were you going to lecture/ or other format?
• Did you engage in foreseeing how the class was going to proceed?
• How were you going to start? Proceed? End?
• Did you think about how you were going to organize your time? (e.g., lecture for 10 minutes. then discuss...)
• What was your goal/purpose as you walked into class? What did you want them to walk away with?

• Now, I would like you to go over the lecture with you.
• How did you begin? Proceed? End?
• Did you teach the way that you had foreseen it?
• Did you use your time the way you had foreseen it?
• Did you cover all the topics you had planned?
• Did you go beyond your notes?
• Did you use all prepared material?
• Did you encounter anything unusual?
• Did you make any changes in your planning?
• If any, what were they?

Appendix C

Consent Form

I have voluntarily agreed to participate in this study and understand that I may withdraw at my own discretion and for any reason at any time.

I understand that the study is an investigation of professors' planning processes.

I understand that my task is to systematically log all the activities I engage in before the planning of one of my lectures, and to later explain my activities and review how the lecture proceeded during a taped interview.

I understand that my identity will be protected and that all records will be coded to guarantee anonymity.

Signature: _____

Date: _____

Appendix D

Coding Categories

Needs Assessment

Flexibility of plan implementation

Adaptation to student needs

Locus of control:
- Student-Initiated
- Instructor-Initiated
- Student-Run

Knowledge integration - placing knowledge in the context of prior learning

Various delivery techniques

Various modes of presentation

Planning general guidelines

Planning specific actions

Reflection over one's teaching - revision of pedagogy

Alternate or contingency plans

Ramsden less evolved - theory I

Ramsden more evolved - theory II

Ramsden most evolved - theory III

Satisfied with conduction of lecture

Management routines

Instructional routines

Monitors student behaviour

Planning notes used as memory cues

Student handouts

Use of library services

Appendix E

Coding Grids

Grid =1

Planning	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9	Subject 10	Subject 11
general guidelines											
detailed planning/discrete entity											
planning based on needs assessment											
same notes year after year											
various mode of presentation											
various delivery technique											
contingency plans											
planning notes as memory cues											
reading											
revise prior to teaching											
visualization of lecture											
handout preparation											
resource material preparation											
class exercise preparation											
abreviation of lecture note											

Grid #2

Teaching / Reflection	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9	Subject 10	Subject 11
flexible plan implementation											
implementation as planned											
monitors student behaviour											
adaptation to student needs											
opportunistic use of class events for goal											
locus of control Student initiated											
locus of control Instructor initiated											
locus of control Student run											
knowledge integration											
various modes of presentation											
various modes of delivery											
pedagogical content knowledge											
learning outcomes in mind											
management routines											
instructional routines											
planning notes used as cues											
student handouts/exercises											
satisfaction with lecture conduction											
use of library services											
metacognitive reflections / evaluation of teaching											
revision of one s teaching											
reaching new comprehension											
Ramsden s stage 1											
Ramsden s stage 2											
Ramsden s stage 3											
incongruence											
provide overview											
provide summary of last lecture											
provide examples											
effective time management											
non effective time management											
usual course of events											
link content with evaluation											