STUDENT-TEACHER REFLECTION IN THE PRACTICUM SETTING

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Abstract

This study demonstrated that the notions of reflective practice, as advocated by Donald Schön, are applicable to student-teachers in practica settings. For Schön, a practitioner is reflective when he or she becomes intrigued or curious about some element of the practice setting, frames it in terms of the particulars of the setting, reframes it in terms of past experience and knowledge, and then develops a plan for future action. Reframing occurs as a response to the 'back talk' in the action setting where something does not happen as expected (producing the 'curious' or 'intrigued' response).

A number of issues specific to student-teacher reflection emerged from the analysis of four student-teachers engaged in a thirteen week practicum. The analysis was guided by three research questions: What is it that student-teachers reflect upon?; What precipitates that reflection?; and What factors enhance or constrain that reflection? The student-teachers in this study reflected upon three main issues: the ownership of their practice; pupil learning; and the different levels of their understanding of practice. From the analysis, it was possible to identify up to four different precipitants or triggers for the types of reflective activity documented: a primary and secondary precipitant at each of the framing and reframing stages. The secondary precipitant at the reframing stage was deemed to be the most significant in terms of student-teacher reflection. Factors that either enhanced or constrained reflection have been summarized in terms of their implications for enhancing reflective practice. These factors included: exposure to a multiplicity of perspectives; intense examination of one's practice; theorizing about one's practice; and the ability to entertain uncertainty.

Finally, the study contributes in three ways to Schön's conceptualization of reflection as it applies to student-teachers in practica settings. Firstly, reflection is born of incidents but is thematic in nature. Secondly, ownership of one's practice is central to a variety of reflective concerns raised by student-teachers. Finally, Schön's coaching models need to be reviewed in light of changes that occur in the relationship between student and sponsor as the action which students reflect upon moves from a virtual world of planning to the real world of performance.

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CHAPTER 1

Introduction

I. The problem

Reflective practice

Professional development is the primary aim of pre-service, induction, and in-service teacher education programs (Zeichner, 1987b). The impact of professional development upon classroom practice is governed by a number factors, one of which is the ability of teachers to be reflective about their practice. It has been argued that reflection should be fostered at the pre-service level and subsequently encouraged as a career-long pursuit (Cole, 1989; Wildman, Magliaro, Niles & McLaughlin, 1990). Gaining insights into the reflective practices of student-teachers[1] is, therefore, an important step in understanding and fostering the development of reflective practice in the field of teaching.

Recent studies have suggested that developing reflective practitioners in school settings is a difficult goal to achieve. A number of barriers exist; for example, the 'apprenticeship of observation' that all students 'serve' as learners in classrooms (Clift, Nichols & Marshall, 1987; Crow, 1987; Feiman-Nemser, 1983; Lortie, 1975; Russell, 1988; Zeichner & Liston, 1987); the conservative influence of teacher preparation programs (Feiman-Nemser, 1983, 1986; Goodman, 1988; Ross, 1987; Zeichner, 1980); and the utilitarian emphasis that seems to pervade the practice setting (Boydell, 1986; Hayes & Ross, 1988; Kilbourn, 1982; Pugach & Johnson, 1990; Wildman et al., 1990). Unless students are encouraged to examine the taken-for-granted-assumptions associated with these barriers, the development of a reflective disposition is likely to be severely constrained. One area which has

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[1] The terms *student-teacher* or *student* will be used exclusively to refer to student-teachers undertaking their professional year of study at a tertiary institution. The term *pupil* will be used throughout this study to refer to children or young adults attending high school. The terms *sponsor teacher* or *sponsor* will be used to denote a school-based 'supervisor,' and *faculty advisor* or *advisor* to denote a university-based 'supervisor.'

considerable potential for precipitating such a dialogue is the practicum setting, and in particular the relationship between the student-teacher and sponsor teacher. The potential contribution of this interaction for promoting reflection on practice is especially significant given that many aspiring and experienced teachers regard the practicum as the most important component of their teacher preparation (Goodlad, 1988; Wideen, Holburn, & Desrosiers, 1987).

Louden (1989) and Grimmett, Erickson, MacKinnon, and Riecken (1990) have shown that the term 'reflection' means many things to many people. For some, reflection means a review of one's practice to ensure fidelity to a particular set of rules. For others, reflection means 'making problematic' particular aspects of one's practice (i.e., examining taken-for-granted assumptions) to gain new insights into that practice. Further, reflection has been conceptualized as a personal activity, as a public activity, or as a combination of the two (Comeaux & Peterson, 1988; Pugach & Johnson, 1990). These various conceptualizations are grounded in particular views of knowledge and their relationship to the practice setting. Recent directions in educational research conceive of professional practice as the *knowledge-in-action* that practitioners exhibit in their daily work. A number of researchers have drawn upon this notion as a theoretical perspective to guide their studies. Donald Schön's (1983, 1987) contribution to a conceptualization of reflective practice is particularly significant in this regard.

Schön's conception of professional practice calls for knowledge-in-action to be understood in terms of reflection-in-action and reflection-on-action. Grimmett (1989) notes that it is Schön's emphasis on the *action* setting that makes his conception of professional practice quite distinctive. Knowledge-in-action, for Schön, becomes the raw material on which reflection operates. Such knowledge is "constructed by practitioners through reflection-in-action (i.e., action generated through on-the-spot experimentation) and reflection-on-action (i.e., action planned on the basis of post-hoc thinking and deliberation)" (Grimmett, 1988, p. 9). For Schön, the interplay between problem setting, problem framing and reframing, experimentation, and 'back talk,' constitute the artistry of professional practice.

Student-teacher reflection in the practicum setting

For the student-teacher, the practicum experience is the first opportunity to engage in systematic reflection on classroom practice. Student-teachers come to the practice setting with various conceptions of teaching and learning (Calderhead, 1988; Cole, 1989; Mertz & McNeely, 1992; Zeichner & Liston, 1987). As they engage in classroom practice they encounter many events, some familiar and anticipated, others new and surprising. Their conceptions of teaching and learning are supported or challenged accordingly. Both instances present opportunities for reflection and professional development.

When students deal with familiar and anticipated classroom events they are likely to draw upon a repertoire of responses based upon prior experiences as pupils in schools, as students at universities, as leaders in positions of responsibility, etc. (Calderhead, 1992; Cole, 1989). Inevitably, student-teachers are challenged by many new and unanticipated classroom events for which no appropriate response will be present in their current repertoire (Housego, 1987). In these situations, students will have to construe responses sensitive to the situation at hand and bring to bear any prior knowledge and experience that might be appropriate. At times, this is an exciting and invigorating experience, at other times it is unnerving and bewildering (Feiman-Nemser, 1983). All classroom events, be they anticipated or unanticipated, routine or non-routine, provide opportunities for reflection - a chance to examine practice in the light of past experience and knowledge, and to develop or modify a plan for future action. In many instances, student-teachers may recognize these opportunities and reflect upon their actions.

However, there may also be instances, when a student-teacher fails to recognize the significance of a particular classroom event. Take, for example, a student-teacher that this researcher observed recently. Early in the practicum, the student-teacher introduced the concept of 'equilibrium' to a Grade 11 Chemistry class. In the ensuing classroom discussion it became apparent that some pupils were using 'equilibrium' to denote a physical property (i.e., weight) rather than a chemical property (i.e., the constituents of a chemical reaction). The pupils' confusion was further exacerbated when the student-teacher drew a teeter-board on the overhead projector and proceeded to use this as an analogy for 'balancing' chemical equations. The student-

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teacher remained blissfully ignorant of the pupils' quandary throughout the lesson. When suitable strategies for checking pupil understanding are absent a student-teacher needs the benefit of some form of collaborative reflection to assist in the examination of his or her practice. At such times, the role of the sponsor teacher is critical (Erickson & MacKinnon, 1991).

The nurturing of reflective practice is perhaps one of the most difficult tasks faced by the sponsor teacher (Nolan and Huber, 1989). It is important for the sponsor teacher to be sensitive to the ways in which the novice teacher is likely to view and reflect upon the practice setting. The sponsor teacher must guard against the temptation of assuming that what he or she 'sees' is identical to what the student-teacher 'sees' (Schön, 1987). Similarly, the sponsor's reflections about the practice setting may be very different to those of the student-teacher. Therefore, the sponsor must hold in abeyance his or her own agenda and carefully attend to the student-teacher's reactions to the practice setting (Kilbourn, 1990). The temptation to produce in the student-teacher a 'carbon copy' of the sponsor teacher militates against the development of reflective practice.

II. The study

The following description of the study is divided into six sections: purpose, research questions, method, analysis, pilot study, and limitations. These sections provide a composite picture that will guide the reader through the remainder of the thesis.

The purpose of the study

This study is set in the "dailiness" (Lieberman & Miller, 1984) of student-teaching practice and is grounded in the notion that knowledge is personally constructed and socially mediated as students reflect upon practice (Schön, 1983, 1987; von Glasersfeld, 1987). As such it draws upon Schön's explication of reflective practice as outlined in his two books: The reflective practitioner: How professionals think in action (1983), and Educating the reflective practitioner: Towards a new design for teaching and learning in the professions (1987). For Schön, a practitioner is reflective when he or she becomes intrigued or curious about some element of the practice setting, frames it in terms of the particulars of the setting, reframes it in terms of past

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experience and knowledge, and then develops a plan for future action. Reframing occurs as a response to the 'back talk' in the action setting where something does not happen as expected (producing the 'curious' or 'intrigued' response). This definition of reflection is used throughout this study.

The purpose of this study is to examine the applicability of Schön's conceptualization of reflective practice in an *educational* setting, in particular, a student-teacher practicum setting. And, if Schön's conceptualization is viable in this setting, an additional aim is to determine the circumstances which are conducive to the development of student-teacher reflection in this setting. Past studies have provided some insights into different aspects of a student-teacher reflection (Borko, Livingston, McCaleb, and Mauro, 1989; Kilbourn, 1982; MacKinnon, 1989). The aim of the present study is to provide a comprehensive picture of student-teacher reflection, from a Schönean perspective, by examining the practices of student-teachers as they prepare, teach, and conference their lessons, with their sponsor teachers while on practica.

Research questions

To examine student-teacher reflection in the practicum setting, the study is divided into three parts: the first, to identify **what** student-teachers reflect upon; the second, to establish what **precipitates** that reflection; and the third, to identify factors that **enhance** or **constrain** reflection. Thus, the research questions are:

- *What do student-teachers reflect upon?*
  In particular, it is important to identify the process of framing and reframing in which the student-teachers engage as they reflect upon issues, problems, etc., encountered in the practice setting.

- *What precipitates reflection?*
  This question seeks to identify elements within the practicum that trigger the reflective process and to determine the effect of these upon the students' framing and reframing of issues, problems, etc.

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- *What factors enhance or constrain reflective practice?*
  The broad focus of this question is upon the practicum in general, that is, factors such as: interaction with pupils, the use of video tape, past experiences as a learner, etc. The specific focus of this question is upon the interaction between the student-teacher and sponsor teacher.

Contribution of the study

Donald Schön (1983, 1987) conceptualized reflective practice as the knowledge practitioners display when they are confronted with problematic situations. His studies are grounded in the practice of master teachers working with gifted protégés; for example, Quist, a master designer, with Petra, an advanced design student, and Franz, a world famous pianist, with Annon, a talented young pianist. Using these 'ideal' situations as exemplars, Schön described how reflective practice might look, be identified, and be nurtured. The present study extends Schön's work by utilizing his conception of reflective practice, gleaned from these 'ideal' settings, and applying it to 'everyday' student-teacher practica settings. No attempt has been made to select exemplary teachers or students. Indeed, every attempt was made to ensure that the settings were typical of most student-teacher practica (save for the presence of the researcher and the participants involvement in the project).

Further, the study moves beyond 'clinical' planning settings, which are the basis for much of Schön's analysis - settings in which students experiment in a relatively risk-free 'virtual' world - and includes actual performance settings - settings in which students put into practice their planning in a 'real' world environment (i.e., high school classrooms).

The results of this study also contribute to a conceptualization of the practicum *writ large* and the role it might play with regard to the professional development of both the student-teacher and the sponsor teacher.

Research method

A regular teaching cycle, defined in this study as a lesson taught by a student and the pre- and post-lesson discussions with the sponsor teacher that

surround the lesson, provided the structure for the investigations outlined in the research questions. Overlaid on the regular teaching cycle were a series of stimulated video recall sessions (Tuckwell, 1982). These sessions allowed both the student and the sponsor to comment upon each stage of the regular teaching cycle. The combination of the regular teaching cycle and the video recall sessions is defined in this study as a 'reflective teaching cycle.' Four student-teachers and their respective sponsor teachers participated in this study. Five reflective teaching cycles were conducted for each student over the course of their practica (approximately one cycle every two weeks). In addition to the reflective teaching cycles, a number of semi-structured interviews (Mishler, 1986; Spradley, 1979) were conducted with the students and the sponsors.

Data Analysis

The tapes from each of the reflective teaching cycles and the semi-structured interviews were fully transcribed[2]. The analysis of the data was based upon the constant comparative method in which incidents and events were catalogued and grouped according to common features and characteristics (Glasser & Strauss, 1967; Lincoln & Guba, 1985). As different trends emerged some groups were collapsed into a single category, while others were divided into further categories. As MacKinnon (1989) warns, there are difficulties associated with this process:

> Research of this kind . . . is afflicted by a struggle to make something of 'the data.' These polymorphous bodies of stirring and shifting things that will eventually be said to have particular shapes and regularities - indeed to count for something, to represent particular significances - seem at first glance to require <u>identification</u> and at another, <u>fabrication</u> (p. 47).

In an attempt to avoid the dangers associated with this method of data analysis, an extensive audit trail and member checking process was conducted throughout the study.

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2   The exception was the video tapes of the lessons for which only the sections relevant to the discussion between the student and sponsor were transcribed.

The analysis of the data was based upon four levels of 'transformation' (Novak & Gowin, 1984). The first was the verbatim transcription of all data tapes. The second level was the identification of the individual components of reflection (precipitants, frames, reframes, and plans for future action). The third level was the identification of (1) reflective themes, (2) specific factors that enhanced or constrained reflection, and (3) general factors related to student-teacher reflection in the practicum setting. At the fourth level, the factors and themes were categorized according to dominant trends and patterns.

Pilot study

A pilot study was conducted with one student prior to the main study. Although the intention was to collect a sample (18 tapes) of the full data set (50 tapes), circumstances permitted the collection of a complete data set. A preliminary analysis demonstrated that the data collection procedures were robust and successful in 'getting at' student-teacher reflection. As a result, the procedures used for the pilot study were used for the main study. Following the analysis of the three students in the main study, the researcher re-analysed the full data set from the pilot study and included the results with the main group. Therefore, the study represents the reflective practices of four student-teachers on practica.

Limitations of the study

There were four limitations to this study: (1) student-teacher reflection was not confined to the five reflective teaching cycles that comprised the data collection, (2) the presence of a video camera and the researcher in a number of lessons taught by the student-teachers, (3) the project, itself, was an intervention in the student-teachers' reflections upon their practices, and (4) the dual role played by the researcher, that is, faculty advisor cum researcher.

The most significant limitation to the study was that the student-teachers' reflections on their practices were not bounded by such things as the time of the day, physical location, interactions with the researcher, etc. The students reflected on their practice within and beyond the time set aside for data collection. Cognizant of this limitation, the study was designed to

capture the student-teachers' reflections at times that were felt to be the most critical during the practica. To this extent the study was successful. Clearly, though, it was not possible to document the full range of the student-teacher reflection across the whole practicum experience.

The second limitation was related to the presence of a video camera and researcher in the student-teachers' classrooms. This presence immediately altered the setting. No longer were the classrooms 'typical' student-teacher classrooms. To ameliorate this 'intrusion', as far as possible, the researcher video taped a number of the students' classes before the project began to allow both the students and pupils to become comfortable with the presence of the camera and researcher. It appeared that this significantly reduced the effect of the camera and researcher in the classrooms, for both students and pupils.

The third limitation was the 'interventionist' nature of the project. Clearly, asking students to watch video tapes of their practices was likely to enhance their reflections upon those practices. In this regard, an important assumption needs to be highlighted. From the outset of this project, there was an assumption that student-teachers did reflect upon their practices. If the researcher had felt otherwise, the research questions would have been considerably different. For example, a researcher with a different perspective might have asked 'Do student-teachers reflect upon their practice?' and not, as in this study, 'What do student-teachers reflect upon?' Where the project did intervene in the students' practica was in providing an opportunity for the students to reflect on their practices. What is important (particularly with regard to the research questions) was that the project did not 'require,' 'demand' or 'mandate' that the student reflect on their practices. Nor did the project suggest an agenda for student-teachers' reflections. Thus, the reflective themes identified in this study were the student-teachers' **own** reflections upon their practices. As such, the claims emerging from the study are bounded by the limitation that the project provided a structured opportunity for the students to reflect on their practice.

The fourth limitation was the researcher's dual role as faculty advisor and researcher. Two questions arise in relation to this issue: (1) 'Was it possible for the researcher to collect data on the students' reflections while

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acting as faculty advisor?, and (2) 'What checks were in place to ensure that the role of faculty advisor, as played by the researcher, was consistent with 'typical' practica settings.' With regard to the first question, all students were interviewed by an independent researcher at the end of the study. These interviews were to determine the extent to which the students felt comfortable in sharing their doubts, confusions, difficulties, etc, (i.e., elements critical to Schön's notion of reflective practice) with the researcher. A full report of these interviews, including extracts from the interviews, is contained in Appendix A. In short, the effect of the dual role played by the researcher in terms of answering the research questions appeared to be minimal.

With regard to the second issue, to ensure that the role of faculty advisor as played by the researchers was consistent with the supervision that other students were receiving outside the project, the researcher supervised an additional number of students beyond the project. As such, the researcher monitored his supervision of students within and beyond the project. While it was impossible to ensure identical supervision between the two contexts (or, for that matter, between any two students), this strategy provided a check for consistency in terms of faculty advising within and beyond the project.

III. Organization of the chapters

There are eight chapters in this study. The first four chapters (encompassing the introduction, literature review, and method) provide the foundation upon which the study was based and conducted. The next four chapters are written as individual cases for each of the students (Sally, Tina, Steve, and Jona[3]) in the study. Each of these chapters begins with a map illustrating the number and duration of the reflective themes identified in the case. The reflective themes for the case are then presented in detail. Each of the case study chapters concludes with a one-page summary table of the themes, factors and related issues that emerged from the case. The final chapter draws the results of the case studies together, discusses these results in

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[3]   Pseudonyms for the students and sponsor teachers are used throughout the study.

relation to perspectives in the literature, and considers the implications of this study for reflection in the practicum setting and further research.

CHAPTER 2

Reflective Practice as a Research Agenda in Teacher Education

Chapters two and three present a review of the literature on reflective practice. Chapter two examines the theoretical perspective that led to, and underlies, the current research interest in reflective practice. It begins by contrasting two different perspectives on professional knowledge, the first as received knowledge and the second as knowledge-in-action. The significance of knowledge-in-action is then highlighted against the backdrop of various research efforts designed to depict the knowledge practitioners construct in the immediacy of the practice setting. Of particular importance is the work of Schön who has recently popularized the term 'reflective practice.' The review details Schön's contribution in this regard.

In chapter three, the review of the literature moves from the theoretical to the practical by focussing upon the reflective practices of student-teachers. In particular, it explores the factors which enhance or constrain student-teacher reflection during a teacher education program. The review begins by examining the on- and off-campus components of a teacher education program. The review then considers specific strategies that have been introduced to promote the development of reflective practice. Finally, an argument is put, drawing upon the literature reviewed in both chapters, for the importance of the practicum setting as a research context for investigating student-teacher reflection.

I. Practitioner knowledge as received knowledge

In the early 1900's education was a new and emerging field of study. To gain legitimacy and status within the research community, educationalists sought to imitate the methods and forms of inquiry that had secured the natural scientists their lofty position in the academy. This endeavour, to "travel the same royal road" (Soltis, 1984, p. 6) to success, resulted in educational research being dominated by a paradigmatic orientation that has been variously labelled as positivism (Phillips, 1983), logical empiricism (Harre, 1981), or technical rationality (Schön, 1983). Researchers committed to this perspective assume that: 1) there is a reality that can be discovered, 2) this

reality can be reduced to propositional logic, 3) it can be inferred by objective value-free observation, and 4) the character of the observed phenomena is not altered by the data collection methods (Schubert, 1980).

The implications of this perspective in education were significant. A research programme was initiated to discover universal laws and axioms that would guide teaching practice (Garman, 1986). This programme was based upon linear causal models (Erickson, 1986) which attempted to measure student success in terms of academic achievement gains (Van Manen, 1977). This perspective implied that the knowledge, skills, and competencies required by teachers could be specified in advance (Zeichner, 1987a) and that professional practice could be regarded as the field of theoretical application (Connelly and Clandinin, 1986).

Much of the process-product, teacher effectiveness, and teacher competency research traditions are based upon this 'positivist' perspective (Shulman, 1981, 1986b; Boydell, 1986). Consider, for example, the body of literature that stems from process-product research. Researchers with this orientation believe that the phenomena they explore are natural and therefore stable, and that under intensive analysis and experimentation these phenomena yield "scientific generalizations and trends" (Gage, 1980, p. 14). An attempt is made to find relationships between specified teacher behaviours (processes) and student outcomes (products). An example of this is the *time-on-task* construct which relates academic achievement with the time that individual students spend 'on-task'. While the notion of time-on-task is a useful construct (teachers do try to keep students actively engaged in their work), and has intuitive appeal, critics question the theoretical and methodological assumptions upon which this research is based. For example, Erickson (1986) lists three problems: the research proceeds from an inadequate notion of interaction (a one-way causal influence rather than reciprocal interchange of factors within the learning environment), the research is based upon an extremely reductionist view of classroom processes, and the research outcomes are too narrowly defined in terms of end-of-year achievement scores. Put simply, a scientifically, objective, value-free frame of reference is unlikely to capture, or explicate, the full complexity of the teaching-learning environment.

A study by Smyth (1987, cited in Smyth, 1989b) highlights some of these concerns. During a research project established to study the nature of peer supervision, the time-on-task construct became the focus for a particular set of classroom observations. One of the teachers was concerned about the level of student muttering in his class. After a period of investigation, during which time the teachers recorded both the students' behaviour and associated 'mutterings,' they discovered that contrary to their initial assumption - that muttering was indicative of off-task behaviour - the muttering was indeed work related. They concluded that the capable students verbalized problems to themselves for clarification and the less able students sought clarification from their neighbours. Thus, the observable behaviour, 'muttering,' was not an indication of off-task behaviour but quite the opposite. The teachers involved "issued a challenge to the widespread view that to be on-task students needed to be silent" (Smyth, 1987, p. 13). This example highlights the deceptiveness of surface appearances when taken as indicators of specific behavioural patterns. What process-product researchers had often taken as low inference indicators were in reality highly inferential (Erickson, 1986).

Implications for teacher education

The seductive simplicity of readily codified behaviours, which emanated from 'positivist' research, had implications for teacher 'training.' Teacher educators were quick to incorporate the findings from teacher effectiveness, process-product, and teacher competency research into their preparation programmes (Boydell, 1986; Shulman, 1986a). As Van Manen (1977) notes, given the nature of the 'knowledge industry' at that time, the enthusiastic application of such theory to practice came as no surprise:

> In a culture where the knowledge industry is strongly dominated by an attitude of accountability and human engineering, it is not surprising that the predominant concern of educational practice [had] become an instrumental pre-occupation with *techniques, control,* and means-ends criteria of *efficiency* and *effectiveness.* (p. 209, emphasis in original)

Thus, the preparation of novices was greatly simplified when teaching was viewed as instrumental problem solving made rigourous by the

application of scientific theory (Boydell, 1986; May & Zimpher, 1986; Schön, 1983). Student-teachers were to be technicians who faithfully implemented the results of academic research (Krogh, 1987; Simmons, Sparks, & Colton, 1988; Zeichner & Liston, 1987). As a consequence, teacher education programmes became imbued with a technical, almost scientific, language that was supposedly an accurate representation of classroom practice, for example 'ALT' or Academic Learning Time (Shulman, 1986b; Tabachnick, Popkewitz, & Zeichner; 1979). The notion of the 'teacher as technician' was further enhanced by the positivist assumption that the problems of practice were generalizable across multiple contexts, and as such did not require on-site interpretation or adjustment (Erickson, 1986; Nolan & Huber, 1989; Selman, 1988).

Undoubtedly there exist some generic 'tools of the trade' which have a degree of general applicability. Consider, for example, a simple technique such as addressing a question to a whole class before selecting a pupil to respond; the hope being that each pupil will remain attentive in anticipation that he or she might be called upon to respond. It is likely that most teachers have used this particular technique at some stage. This and other techniques can be employed quite effectively by the discriminating teacher. The use of 'techniques' becomes problematic, however, when they become an expected (mandated?) practice, or the sole *modus operandi* for practitioners.

Some studies show that student-teachers value 'techniques' almost to the exclusion of any other component of their teacher preparation (Campbell, Green, & Purvis 1990; Comeaux & Peterson, 1988; Russell, Munby, Spafford, & Johnston, 1988). MacKinnon and Erickson (1988) suggests that an early dependence upon such techniques is indeed a characteristic of early field experiences, particularly when 'survival' is paramount. They propose that basic techniques need to be mastered before students are able, or ready, to consider more substantive educational issues. The challenge for teacher educators is to select an appropriate time to move students beyond a 'what works' approach to classroom practice (Goodman, 1988). For example, Brown (1990) contends that teachers may require three to four years of teaching experience before they might be expected to reflect on their practice. Closely aligned with a dependence upon techniques is the concern that teachers who

have achieved technical competence often remain at that level (Feiman-Nemser, 1983). Evidence of this is readily noted by anyone who has conducted professional development programs for practicing teachers. There is a strong expectation that presenters will provide materials that can be taken back and used unproblematically in classrooms; quick technological fixes! Van Manen (1977) submits that this desire for technical instrumentality is rooted in the quest for practical relevancy; a norm which pervades the teaching profession and is characterized by the separation of theory from practice, learning 'the tricks of the trade', or learning by trial and error. Such norms as these inhibit systematic inquiry into and reflection upon one's practice. It may be important then to encourage practitioners not only to consider the 'how' and 'what' of their teaching but also the 'why' of their teaching practices (Wildman & Niles, 1987).

It was in this light that researchers began to question the consequences of programmes emphasising 'technical know-how' to the exclusion of more substantive issues related to classroom practice (Krogh, 1987; Richards & Gipe, 1987; Stout, 1989). Van Manen (1977) argues that while the 'how' questions are relevant, other questions must be asked to ensure an adequate interpretation of the 'practical.' Other researchers contend that a purely technical approach to teacher education supports the notion that prospective teachers are passive recipients of knowledge and that they play very little part in determining the substance or direction of their programmes (Handal & Lauvås, 1987; Tabachnick et al., 1979; Zeichner, 1980, 1987a). These researchers note that by highlighting only the technical aspects student-teachers have tended to regard the practice setting as unproblematic, and view their role within schools as one of acquiescence and conformity to existing routines - maintaining the *status quo*. Wildman and Niles (1987) suggest that passive 'compliance' by student-teachers is a serious impediment to career-long professional growth and development; a sentiment echoed by Glickman (1988):

> It is when we believe that someone else can decide for us, or that we can control what will happen, that we stick to a plan that overrides human judgement and we lose the capacity to receive information, to educate and correct ourselves (Glickman, 1988, p. 64).

Increasingly, the model of teaching as merely 'technical prowess' is being challenged. Researchers have begun to re-examine the nature of teachers' knowledge which is 'practical' in more than just a technical or managerial sense (Feiman-Nemser, 1986, 1990). As Hargreaves (1988) notes "teachers are not just bundles of skill, competence and technique; they are creators of meaning, [and] interpreters of the world" (p. 216).

Feiman-Nemser (1986) comments that, until recently, "the prevailing view among researchers had been that teachers had experience while academics had knowledge" (p. 512). Teachers were not seen as possessing a unique body of knowledge and expertise. Researchers have since questioned the service mentality of the 'received knowledge' tradition arguing that it likens teaching to an information processing model that is neither a valid nor accurate description of teacher knowledge (Garman, 1986; Richardson, 1990; Schön, 1983, 1987; Van Manen, 1977).

II. Practitioner knowledge as knowledge-in-action

An alternative perspective that recognizes the dynamic nature of a teachers' knowledge has been referred to as 'knowing-in-action.' This knowing-in-action is manifest in the 'conversation' that takes place between the practitioner and his or her setting (Garman, 1987; Holland, 1987; Schön, 1983, 1987; Van Manen, 1977; Yinger, 1990). Yinger (1990) found the conversation metaphor useful because it acknowledges teaching practice as a social process taking place within a specific context and characterized by the natural 'give-and-take' between the practitioner and the setting. Yinger emphasized that "the language of practice is found in the practitioners action, rather than speech. It is rarely heard, but it is seen and felt" (p. 91). The notion of 'rarely heard' is an acknowledgement that a large part of a teacher's 'knowing' is indeed tacit, evidenced by the fact that teachers themselves have great difficulty in articulating what it is they know, and how they have come to know it (Feiman-Nemser, 1986; MacKinnon, 1989; Richardson, 1990; Shulman, 1987, 1988). Sergiovanni (1985) describes this tacit knowledge as informed intuition:

Professionals rely heavily on *informed* intuition as they create knowledge in use. Intuition is informed by theoretical knowledge on the one hand and by interacting with the context of practice on the other. When teachers use informed intuition, they are engaging in reflective practice. ... Knowing is in the action itself ... (p. 11).

Implications for teacher education

This alternate conception of teacher knowledge, as active construction rather than passive reception, has significant implications for teaching, teacher education, and research on teaching (Erickson & MacKinnon, 1991). From this perspective teacher knowledge is embedded in and emerges out of action (Sergiovanni, 1985; Smyth, 1989); it is a "situated knowledge made powerful by the contexts in which it is acquired and used" (Shulman, 1988, p. 37). This view has resulted in a marked change in the way researchers conceptualize teaching practice (Garman, 1986; LaBoskey & Wilson, 1987; Schwab, 1969; Tom, 1985). Researchers have now begun to examine the specialized knowledge that teachers acquire and use as they encounter the "complex, unstable, uncertain, and conflictual world of practice" (Schön, 1987, p. 12). The purpose is neither to predict, explain, nor to provide rules or regulations, but rather to understand and depict meaningful human action for the purpose of guiding practice (Garman, 1986; Grimmett, 1989; Schön, 1988; Schubert, 1980; Sergiovanni, 1986; Wildman et al., 1990). Research in this genre has variously been referred to as interpretive (Erickson, 1986; Howe & Eisenhart, 1990; Soltis, 1984) or hermeneutic (Habermas, 1973, Van Manen, 1977). Erickson (1986) has suggested interpretive research leads to:

> ... questions of a fundamentally different sort from those posed by standard research on teaching. Rather than ask which behaviours by teachers are positively correlated with student gains on test achievement, the interpretive researcher asks "What are the conditions of meaning that students and teachers create together, as some students appear to learn and others don't? Are there differences in the meaning-perspectives of teachers and students in classrooms characterized by higher achievement and more positive morale? How is it that it can make sense for students to learn in one situation and not in another?" (Erickson, 1986, p. 127)

The focus is on intention not behaviour; on subjective meaning rather than objective observation. There are no such things as stimuli, responses, or measurable behaviours but rather "encounters, lifeworlds, and meanings, which invite investigation" (Van Manen, 1977, p. 214). Teachers are regarded as active agents in the construction of knowledge rather than passive recipients of 'professional' knowledge (Tom, 1985; Zeichner, 1980). Inquiry is grounded in practice, and its end point is action relevant to a specific setting (Connelly & Clandinin, 1986; Eisner, 1983; Firestone, 1987). Research produces 'thick description' of specific cases rather than 'codified abstract realities' garnered from statistical manipulation (Ryle, 1949). The primary concern for interpretive researchers is "particularizability rather than generalizability" (Erickson, 1986, p. 130). Stake (1980) suggests that knowledge of 'the particular' is what practitioners use to make sense of unfamiliar situations; that they begin to identify patterns in new contexts by drawing upon a repertoire of prior experiences:

> Knowledge [of the particular] is a form of generalization . . . not scientific induction, but *naturalistic* generalization, arrived at by recognizing the similarities of objects, and issues in and out of context, and by sensing the natural covariations of happenings (Stake, 1980, p. 69).

Geertz (1973) argues in a similar vein suggesting that generality grows out of the 'delicacy of distinction', rather than the 'sweep of abstraction'; that the use of 'thick description' enables practitioners to place events in an intelligible and personally meaningful frame.

Simmons (1980) and Alderman, Jenkins, and Kemmis (1980) propose that if 'delicacy of distinction' is indeed the essence of interpretive research, then researchers and practitioners need to communicate these distinctions in a 'language' that retains all the richness and subtlety of participant interactions within the context of the setting. Several researchers argue that interpretive studies, and in particular case studies, are powerful vehicles for achieving these aims (Erickson, 1986; Grimmett, 1989; LaBoskey & Wilson, 1987; Russell, 1988; Shulman, 1984, 1986a, 1987; Smyth, 1989; Stake, 1980; Wideen et al., 1987). An increasing number of studies provide such insights

into teachers' practical knowledge. For example, Grimmett and Crehan (1990) report on a case study in which they investigated teacher reflection within a clinical supervision setting. They examined the supervisory dialogue between Barry, an experienced teacher, and Margaret, his principal. Their study was based "on 'thick focused' descriptions derived from extensive field notes taken by two observers" and "stimulated-recall interview transcripts" (Grimmett & Crehan, 1990, p. 216). Their analysis is grounded in the particular and draws upon the interaction between the two participants. They concluded that the important concepts Barry used to structure his practice were derived through experiential metaphors that permeated his thinking about teaching practice, rather than through a process of technical or instrumental analysis.

A second example is a case study by Louden (1989), whose study addressed the problem of "understanding the process of change in teachers' classroom knowledge and action" (p. 1). His inquiry was based upon a collaborative relationship between a teacher and a researcher, in which both jointly planned, taught and conferenced a series of lessons over the course of a year. From this intensive case study, Louden concluded that teachers' understanding of teaching changed slowly, was constructed within the teachers' personal horizons of understanding, and was related to the tradition of teaching in which they worked. He also noted that proposals to change teachers' practice were "proposals to change teachers' lives, and should be approached with care and humility not arrogance and certainty" (Louden, 1989, p. i).

Each of these cases provides a detailed account of the knowledge that teachers construct as they engaged in 'conversations' with the practice setting,' knowledge that is embedded in, and emerges out, of their actions; a knowledge-in-action.

III. Reflective practice

While there is a general consensus among educational researchers that practitioners exhibit knowledge-in-action as they deal with the complexities of teaching, agreeing upon a conceptual framework to describe this 'knowledge' has been more difficult (Noordhoff & Kleinfeld, 1990; Tom,

1985). Those faithful to a Deweyan perspective prefer to visualize teaching as a process of 'deliberation' (Court, 1988); others, like Yinger (1990) see it as 'contemplation'; Fenstermacher (1988) prefers the notion of 'practical arguments'; Noordhoff and Kleinfeld (1990) use the 'heuristic of design'; while Zeichner and Liston, (1987) use a broadly encompassing portrayal of 'the moral craftsperson'. Common to each of these depictions is the notion that teachers' *reflect* upon their practice. Grimmett, Erickson, MacKinnon, and Riecken (1990) and Grimmett (1988) have brought some clarity to the proliferation of different conceptualizations by categorizing them according to "how research-derived knowledge is viewed as contributing to the education of teachers" (p. 11). Grimmett et al. (1990) have distinguished between three different uses of the term reflection: as directing practice, as informing practice, or as transforming practice.

The first category is consistent with a view of teacher knowledge that is received knowledge; knowledge that is readily applicable to the practice setting. Teacher reflection in this sense would be viewed as "thoughtfulness about action - thoughtfulness that leads to conscious, deliberate moves, usually taken to 'apply' research findings or educational theory" (Grimmett, 1988, p. 11). Practitioner reflection results in *directing* or *controlling* action. The second category views teacher reflection as "deliberation and choice among competing versions of 'good teaching'" (Grimmett, 1988, p. 12). Conceptualizations in this category place importance on the context and consequences for pupil learning. Reflection upon different choices *informs* action. In the third category, reflection is viewed as the "reconstruction of experience, at the end of which is the identification of a new possibility for action" (Grimmett, 1988, p. 12). There are three sub-categories delineated within this category. In the first, reflection results in new understandings of the practice setting, the focus being the act of problem setting. In the second sub-category, reflection results in new understandings of self-as-teacher, the focus being on the individual teacher in the practice setting. In the third sub-category, reflection results in new understandings of taken-for-granted assumptions about teaching (the focus being social, political, and cultural aspects of the practice setting). In each of these cases reflection through the reconstruction of experience *transforms* practice.

Consistent with the shift in perspective of practitioner knowledge from being received knowledge to knowledge-in-action, the focus of recent research into teaching practice has been within the third category outlined by Grimmett. Interest in this area has been stimulated by the work of Schön (1983, 1987) who recently popularized the term 'reflective practice' (Feiman-Nemser, 1990; Richardson 1990). More importantly Schön, drawing upon the writings of Dewey, has framed his conceptualization of reflection in terms of the immediacy of the action setting. For Schön, thought is embedded in action, and knowledge-in-action is the corner-stone of professional practice.

IV. Schön's notion of reflective practice

Schön's work was particularly timely in that it introduced an alternative way of approaching teachers' thinking and action at the same time that 'interpretivist' research was gaining legitimacy in the educational community (Richardson, 1990). Schön contends that the dominant positivist orientation of the professional schools often overlooked education for the 'artistry' of practice. He argues for a new epistemology of practice based on reflective practice; reflective practice being the 'artistry' displayed by competent practitioners as they confront problems which are ambiguous, unclear or indeterminate. Schön's solution is to include, as the core of professional education, a reflective practicum. The main features of a reflective practicum being learning by doing, coaching that accompanies teaching, and reciprocal reflection between student and coach. Simply put, Schön, submits that the choice is between the *rigour* of technical rationality or the *relevance* of reflective practice:

> In the varied topography of professional practice, there is a high, hard ground where practitioners can make effective use of research-based theory and technique, and there is a swampy lowland where situations are confusing "messes" incapable of technical solution. The difficulty is that the problems of the high ground, however great their technical interest, are often relatively unimportant to clients or to the larger society, while in the swamp are the problems of greatest human concern. Shall the practitioner, stay on the high ground where he can practice rigorously, . . . or shall he descend to the swamp where he can engage

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the most important and challenging problems if he is willing to forsake technical rigour? (Schön, 1983, p. 43)

Routine and non-routine problems

Schön is particularly interested in the knowledge that practitioners bring to bear on the problems they encounter in the action setting. He argues that a technical rational approach holds that the practice setting is primarily concerned with instrumental problem solving. For example, when a practitioner is confronted with a problem, he or she identifies the problem as being of a particular type and then applies an appropriate technique to solve the problem. Simply put: If this is problem 'A,' apply technique 'A'; if this is problem 'B', apply technique 'B,' etc. Thus, practitioner knowledge is oriented towards problem solving. Underlying this perspective is the assumption that the problems of practice are *routine*; that they are knowable in advance, and have been subjected to a set of rule-like generalizations that are applicable across multiple settings (Zeichner & Liston, 1987). Thus, under a technical rational approach, the practice setting is characterized by *problem solving* made rigorous by the application of standard theories and techniques.

Schön follows this analysis of problem solving with the question 'What happens when practitioners are faced with *non-routine* problems?' Non-routine situations are at least partly indeterminate, and are not immediately amenable to a technical solution. From his observations, Schön postulates that when practitioners are confronted with problematic situations, situations that cannot be dealt with by the application of generalized techniques, they engage in a very different process, that of *problem setting*. It is this notion of problem setting that sets reflective practice apart from technical rationality. Schön defines problem setting as the process in which a practitioner names the things which he or she will attend to and frames the context in which he or she will attend to them. When confronted by non-routine problems, skilled practitioners learn to conduct frame experiments in which they impose a kind of coherence on 'messy' situations. They come to new understandings of situations and new possibilities for action through a spiralling process of framing and reframing. Each reframing suggests a new way of looking at a problem that lends itself to a method of inquiry in which practitioners have confidence. Through the effects of a particular action, both

intended and unintended, the situation 'talks back.' This 'conversation' provides the data which may then lead to new meanings and further reframing. Thus, "reflection involves the rigorous testing of inferences (suggestions) by mental elaboration and overt action" (Grimmett, 1988, p. 6). In this sense *problem setting* and *problem solving* are interdependent, a particular line of action follows from a frame that has been engaged to set the problem (MacKinnon & Erickson, 1988).

In the 'conversation of practice,' reflective practitioners listen and reframe problems drawing on past experience and knowledge, and construct new knowledge *en route*. They make sense of new and unusual situations of practice by comparing and contrasting them with situations previously encountered. Schön (1987) postulates that being able to 'see' a new situation in this manner is an important element of reflective practice:

> To see *this* [situation] as *that* is not to subsume the first under a familiar category or rule. It is rather, to see the unfamiliar situation as both similar to and different from the familiar one, without at first being able to say similar or different with respect to what. The familiar situation functions as a precedent, or a metaphor . . . an exemplar for the unfamiliar one (p. 67).

Therefore, the role that knowledge plays in this conception of practice, is to provide the practitioner with metaphors that allow him to appreciate and transform his practice (Grimmett, 1989; Noordhoff & Kleinfeld, 1990). For Schön (1988):

> . . . a reflective teacher builds her repertoire of teaching experience . . . not as methods or principles to be applied like a template to new situations, but as stories that function like metaphors, projective models to be transformed and validated through on the spot experiment on the next situation (p. 26).

Schön also notes that framing and reframing differs from person to person. Practitioners will make sense of, and frame, problems in different ways depending upon the repertoire of experience and knowledge they bring

to a particular setting. This has important implications for experienced practitioners who are charged with the responsibility of inducting novices into the professions, for example, sponsor teachers working with student-teachers in a practicum setting. Experienced practitioners must be aware that what they are likely to 'see' in a particular situation is often markedly different to what the novice is likely to 'see.' As such, an induction grounded in *reflective practice* demands that novices' perceptions of problematic situations be both sought and valued as valid and meaningful interpretations of the situation.

Having considered the role reflection might play in dealing with non-routine problems, Schön returned to the issue of routine problems. It has been noted above that when intuitive action leads to surprise (as in the case of a non-routine problem) practitioners respond by reflecting upon their practice. Alternatively, Schön suggests, when intuitive, spontaneous, action yields nothing more than the results expects, as in the case of a routine problem, practitioners tend not to think about their actions. He argues that the tacit understandings practitioners develop in routine situations are rarely subject to reflective inquiry. Schön refers to this unconscious repetitive action as 'overlearning.' He argues that practitioners need to problematize routine practices in much the same way as non-routine practices. Only in this way will 'taken-for-granted assumptions' be made explicit and available for reflective examination. Thus, Schön advocates that reflective practice, as opposed to repetitive practice, should become the *modus operandi* of professional activity. This notion of reflection allows teachers to see themselves as other than trained technicians and validates the kind of expertise and experience they bring to the practice setting (Kilbourn, 1988).

Reflection in and on action

Schön also differentiates between two types of reflection: reflection-in-action and reflection-on-action. In his first book, 'The Reflective Practitioner,' Schön (1983) refers almost exclusively to reflection-in-action. According to Schön, reflection-in-action is that which takes place in the immediacy of the action setting and is often triggered by surprise or intrigue. Schön suggests that a practitioner's reflection-in-action is bounded by the 'action-present,' the zone of time in which action can still make a difference

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to a situation. In his second book, 'Educating the Reflective Practitioner,' Schön (1987) extends his conception of reflection to include reflection-on-action, and reflection-on-'reflection-in-action.' This additional time dimension accounts for reflection beyond the 'action-present.' Others have speculated on the effect of reflection in and on action as it relates to the practice setting. Yinger and Dillard (1986, cited in Comeaux & Peterson, 1988) suggest that reflection-in-action affects directly the action part of the teaching cycle, while reflection-on-action affects the design phase. To Noordhoff and Kleinfeld (1990) the value of reflection-on-action is that practitioners are more likely to move beyond their espoused theories and begin to critically examine their theories-in-use.

An appreciative system

Underlying Schön's notion of reflective practice, be it in- or on-action is the 'appreciative system[4]' that professionals and novices brings to the action setting. This system consists of the practitioner's repertoire of values, knowledge, theories, and practices. As Hayes and Ross (1988) and Ross (1990) note a practitioner's appreciative system influences the types of dilemmas that he or she will recognize, the framing and reframing of problems that will occur, and the judgements that will be made about the outcomes. Schön (1987) advises that in order to see professional practice as a frame experiment, or as a 'reflective conversation' with the practice setting, the appreciative system is continually being constructed by the practitioner: "In the constructionist view, our perceptions, appreciations and beliefs are rooted in worlds of our own making that we come to accept as reality" (p. 36). In other words, if professional practice is to encompass reflection it must be grounded in a world view that is based upon a constructivist perspective. Ross (1987) states that if teacher educators are to have an impact upon the appreciative system of student-teachers, they must appreciate the students' levels of understanding practice, shape communication to the current level of student understanding, and challenge the student's current level of reasoning.

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[4]   Goodman (1988) prefers the phrase 'intuitive screen', rather than appreciative system, as the referent which students use to make sense of the activities and ideas in the action setting.

The importance of the practice setting

For Schön, the process of reflection is best appreciated by students in the reality of the practice setting. Indeed, because reflection is an integral part of 'swamp-life' it cannot be taught within confines of a lecture theatre. Thus, students can only come to have some understanding of reflection in the process of **doing** (Houston & Clift, 1990). Only then will they begin to understand **what it is** that they need to learn. Underlying this notion of reflection is again a constructivist perspective; a process whereby practitioner and student construct meaning from each other's messages. Schön (1987) elaborates:

> . . . it is not a kind of telegraphy in which meaningful signals are directly transmitted from one participant to the other. Rather, each participant must construct for himself the meaning of the other's messages and must design messages whose meanings the other can decipher (p.95).

Driver and Bell (1986) make a similar argument in relation to pupil learning: "It is not so much what we abstract from a situation as the constructs we bring to it which determines the sense we make of it" (p. 448). Furthermore, the meanings that students initially construct from their instructors' descriptions are very likely to be incongruent with the meanings their instructors intend. When students try to act on what they have seen or heard, they may reveal to themselves, and their coaches, the prior knowledge they bring to their practica and the understandings they have constructed from their coaches' actions. The clarification of intended meanings and the discovery and resolution of incongruities between instructors' intentions and students' understandings are best achieved through **action** and **reflection**. The purpose of questioning is "not to assess but to encourage dialogue and to stimulate students to view situations from multiple perspectives" (Ross, 1990, p. 106). According to Schön, when the process works well there is a kind of reciprocal construction that leads to a convergence of meaning. Schön likens the role of a constructivist teacher to that of a coach:

> Here, [the teacher] would be attentive to the ways in which children's learning is like or unlike the kinds of learning they have detected in themselves. They would be encouraged to think of their teaching as a

process of reflective experimentation in which they try to make sense of the sometimes puzzling things children say and do, asking themselves, as it were, "How must the kids be thinking about this in order to ask the questions, or give the answers, they do?" (Schön, 1987, p. 323).

A reflective practicum

Schön's 'education for artistry' requires that student learning be undertaken in a practicum setting, a virtual world, that allows students to experiment at a lower cost (MacKinnon & Erickson, 1988). For this, he recommends a 'reflective practicum.' Such a practicum would be characterized by:

- *learning by doing*, where the practicum would become the core of the curriculum for teacher preparation, rather than an 'afterthought' for applying the theories and techniques taught in course work at the university,

- *coaching rather than teaching*, where "the coach's legitimacy does not depend on his scholarly attainments or proficiency as a lecturer but on the artistry of his coaching practice" (Schön, 1987, p. 311), and

- *a dialogue of reciprocal reflection in- and on-action between coach and student*, that is, the search for convergence of meanings by seeking to enter into each other's way of seeing a particular problem and also the way each is framing the interaction in which they are engaged.

For this task Schön identifies three models of coaching: Follow Me, Joint Experimentation, and Hall of Mirrors. Each places different demands on the competencies of the coach and student. *Follow Me* is foundational to all three models. Essential to this model are 'telling and listening' and 'demonstrating and imitating.' Mindful of the paradox of learning a new competence ("a student cannot at first understand what he needs to learn, and can learn it only by beginning to do what he does not yet understand" - Schön, 1987, p. 93), Schön asks the student to willingly suspend disbelief and autonomy and to enter into a temporary relationship of trust and dependency. The student will have to *follow* the instructor even when he or

she is unsure - indeed, just because he or she is unsure! In Follow Me, the 'telling' might be a description, a criticism, a suggestion, or even a series of examples. For each of these the student must carefully attend to what the coach has to offer. He or she must begin to construct, and reflect on the information shared by the coach.

As a reflective practicum develops, the student will be invited, sooner or later, to attend to his or her own preferences and to take these, rather than those of an external authority (i.e. the coach), as the criteria by which to regulate his or her actions. For *Joint Experimentation* to be feasible, several conditions must be met:

- there must be a way of breaking the larger task into manageable problems,
- the student must be able to say what effects he or she would like to produce, and
- the coach must be willing to keep instructional goals within the bounds of the model.

Joint Experimentation can be used to help a student see that he or she is free to set objectives. For Schön, a key indicator of Joint Experimentation within a reflective practicum is:

. . . [when] students and coaches begin to talk with each other elliptically, using shorthand in word and gesture to convey ideas that to an outsider seem complex or obscure. They communicate easily, finishing each other's sentences or leaving sentences unfinished, confident that the listener has grasped their essential meaning (Schön, 1987, p.100).

The two models, Joint Experimentation and Follow Me, are distinctive ways of fulfilling the coaching task. Each is appropriate to different contexts and demand different competencies from the coach and student. In the third of the three models, *Hall of Mirrors*, the student and coach continually shift their frame of reference:

They see their interaction at one moment as a re-enactment of some aspect of the student's practice; at another, as a dialogue about it; and at still another, as a modeling of its redesign. In this process, they must continually take a two-tiered view of their interaction, seeing it in its own terms and as a possible mirror of the interaction the student has brought to the practicum for study (Schön, 1987, p. 297).

Thus, the coach, while educating the student, mirrors the very competencies he wishes the student to use in his or her professional practice. If the coach wants the student to surface confusion and uncertainty about the practicum setting, then it is incumbent upon the coach to surface his or her own confusion and uncertainty about the practice setting. To the extent that he or she "can do so authentically" (Schön, 1987, p. 286), the coach models for his student ways of seeing error and uncertainty as opportunities for learning. A Hall of Mirrors can be created only on the basis of 'parallelisms' between practice and practicum, so that coaching resembles the practice to be learned.

Schön cautions that the three coaching models are ideal types. A coach may shift from one to another, adapting to the needs of the student. Moreover, the three approaches may be combined. In a fundamental sense, however, a coach always uses Follow Me to communicate his professional practice; he demonstrates, and expects his students to creatively imitate, the particular kind of learning-by-doing on which the practicum depends.

V. Issues related to Schön's conceptualization of reflective practice

Several researchers have been concerned with the sharp distinction Schön has drawn between the *science* of technical rationality ('rigour') and the *art* of reflective practice ('relevance'); that the two perspectives are in some way mutually exclusive and that the tension of reform is between a conception of teaching as a technical enterprise (which would only improve as the research base improved) and teaching as a reflective activity (which would only improve as teachers became inquirers into their own practice) (Gilliss, 1988; Harris, 1989; Selman, 1988; Shulman, 1988; Wildman et al., 1990). Grimmett (1989) counters that Schön is not so much pitting technical rationality against reflective practice as "contrasting the use of knowledge in accordance with the norms of technical rationality and the knowledge

derived and used reflectively in the action setting" (p. 25). In a similar vein, MacKinnon and Erickson (1988), Calderhead (1989), and O'Gorman (1989) state that Schön's intention is not to define the two as competing models, but to highlight the different contribution each makes to professional practice. In Schön's own words, "the dilemma of rigour or relevance may be resolved if we can develop an epistemology of practice which places technical problem solving within a broader context of reflective inquiry" (Schön, 1983, p. 69).

Some researchers have questioned Schön's premise that reflection occurs only in conditions of uncertainty - "Surprise and puzzlement are at the heart of reflective teaching" (Schön, 1988, p. 22). Indeed, Grimmett (1989) points out that research on reflective practice has been centred primarily upon situations that perplex practitioners. LaBoskey (1989), Selman (1989), and Houston and Clift (1990) in addressing this issue suggest that reflection-in-action can be both *spontaneous* (as the result of a perplexing situation) and *deliberate* (as the result of making an element of one's practice problematic). They agree that surprise and intrigue are powerful triggers to reflection-in-action but also believe that practitioners intentionally engage in reflection-on-action. Schön's (1987) second book, which introduces the notion of reflection-on-action is, in part, a response to issues such as these. LaBoskey (1988) advises that, while definitional difficulties still remain, teachers should be encouraged to problematize their teaching both within, and beyond, the action setting. Russell et al. (1988) suggest that, although reflection may not always be a conscious activity, when teachers are placed in situations where reflection is encouraged, they are usually enthusiastic and willing participants in the process.

Other researchers caution that Schön's primary data sources were one-to-one action settings (an architect with a student, a psychotherapist with a client, a music teacher with a student) (LaBoskey, 1989; Ross, 1987). As such, these action settings are considerably different to that of teachers in elementary and secondary school environments. For this reason, Kilbourn (1988) questions whether reflection-in-action can remain alive at all within the daily practice of an elementary or secondary classroom, where teacher survival is often based upon routinization. Kilbourn has suggested, therefore, that reflection-on-action may be a more fruitful concept for

understanding, and talking about professional development in teaching. Court (1988) argues even more forcefully that reflection-in-action is a misnomer, that any reflection requires "at least a momentary time-out from action" (p. 146) and, therefore, reflection-on-action is the more appropriate concept when considering the professional knowledge that practitioners construct as they interact with the practice setting.

Cinnamond and Zimpher (1990) are concerned that reflective practice has been regarded largely as an individual activity. They argue that there has been a general omission of any acknowledgement of the potentially interactive nature of the reflective process. They call for a greater emphasis to be placed upon the behaviours, values, and orientations of the constituent members of the communities in which practitioners work and are socialized. Similarly, Feiman-Nemser (1986) states that an appreciation of interactive dialogue that takes place between the various cultures within a particular setting is an integral part of the 'sense making' that emanates from the reflective process.

The concerns raised in this section extend Schön's notion of reflective practice rather than detract from it. As has been noted, Schön has responded to some of these issues by further refining his conception of reflection (Schön, 1987). In a recent book, edited by Schön (1991), The Reflective Turn, other researchers have begun to address some of these issues.

CHAPTER 3

Factors That Enhance or Constrain Reflective Practice

The six sections of this chapter address a number of practical issues related to the factors that enhance or constrain student-teacher reflection. The review begins with an examination of the influence of a student's prior knowledge and experience (i.e., what a student brings to a teacher education program). In the second section, the influence of the on-campus course work is reviewed (i.e., what happens at the university). In the third section, the influence of the off-campus practicum is reviewed (i.e., what happens in the school). Given the research attention that the triadic relationship has received in the literature (i.e., the relationship between student, sponsor, and advisor in the practicum setting), the fourth section is devoted to an examination of this relationship in terms of enhancing or constraining student-teacher reflection. The fifth section provides an overview of the programmatic responses that have emerged in response to the issues raised in the earlier sections. The concluding section draws upon the combined reviews of the literature (both theoretical and practical) to argue that the practicum is an important context for continuing research into student-teacher reflection.

I. The prior knowledge and experience of the students

Student-teachers enter formal teacher education programs with an extensive knowledge of *teaching and learning* already gleaned from their experience in elementary and secondary schools (Clift et al., 1987; Crow, 1987; Feiman-Nemser, 1983; Russell, 1988; Zeichner & Liston, 1987). Lortie (1975) refers to this experience as the 'apprenticeship of observation,' and Feiman-Nemser (1983) calls it the 'hand of the past.' Feiman-Nemser (1983), Zeichner (1980), and Blakey, Everett-Turner, Massing, and Scott, (1988) suggest that it is through this process students internalize models of teaching. Further, some researchers contend that there is a strong tendency for students to duplicate in their own practice the methods of their former teachers; that is, to teach as they were taught (Nolan & Huber, 1989; Ross & Hannay, 1986). This tendency also arises from a reluctance on the part of the students to relinquish practices they have become familiar with during their own school careers (Feiman-

Nemser, 1983). To overcome this tendency Feiman-Nemser (1983) argues that students should problematize their own conceptions of teaching:

> Clearly biography is a powerful influence . . . Unless future teachers get some cognitive control over prior school experience, it may influence their teaching unconsciously and contribute to the perpetuation of conservative school practices (p. 153).

Gaskell (1985), and Wideen et al. (1987) concur, adding that unless students examine their prior experiences, the effect will be a strong tendency to support unquestioningly the *status quo* within schools.

However, prior experience may not always be detrimental to the development of reflective practice. Richards, Gipe, Levitov, and Speaker (1989) argue that prior knowledge in the form of personal practical experience might predispose certain students to reflective inquiry. They suggest that students with prior exposure to positions of group leadership might be predisposed to reflection because they may have access to a repertoire of various teaching strategies. As such these students might be more likely to "step back from their teaching in order to consider how the lesson is actually going" (Richards et al., p. 3).

II. The on-campus component - Course work

The on-campus component of a teacher education program also has been regarded as having an important influence upon the reflective practices of student-teachers (Feiman-Nemser, 1983, 1986; Goodman, 1988; Zeichner, 1980). Three areas are particularly prominent in the literature: the conservative influence of teacher education programs, course fragmentation, and isolation of course work from the practice setting.

The conservative influence of teacher education programs

It has been widely assumed that teacher education programs have a liberalizing influence upon students, breaking the grip of past experience and traditional values (Feiman-Nemser, 1983, 1986; Zeichner, 1980). Contrary to this, recent studies have suggested that, despite the rhetoric of reflective practice, the university experience actually reinforces traditional values.

Crow (1987) argues that university personnel often use teaching styles that contradicted the notions of reflective practice that they are seeking to endorse. Crow (1987) and Zeichner and Tabachnick (1981) also refer to a 'hidden' or 'unofficial' curriculum' that pervades university courses and runs counter to reflective practice. Professors, either implicitly or explicitly, emphasize 1) importance of first-hand experience, 2) learning through trial and error, 3) the separation of theory from practice, and 4) the notion that knowledge can be broken into manageable bits and transmitted to the learner (Crow, 1987; Zeichner & Tabachnick, 1981).

This is further compounded by the fact that many novices expect their professors to teach them 'how to teach,' and that this knowledge will transfer directly and unproblematically to the practice setting (Campbell et al., 1990; Russell et al., 1988). Tabachnick, Popkewitz, and Zeichner (1979), and Ross (1987) also found that university professors often encourage students to 'fit in' and comply with current school practices. Thus, it has been argued that university programs endorse acquiescence and conformity to traditional practices and fail "to provide prospective teachers with the conceptual tools which would enable them to transcend the structural contexts within which teaching and learning currently occur" (Zeichner & Tabachnick, 1981, p. 9).

Course fragmentation

Goodman (1988) argues that a further impediment to the development of reflective practice is the fragmented nature of on-campus course work. Programs may need to undergo considerable structural changes if they are to support both individual and communal reflection (Houston & Clift, 1990). Shulman (1988) warns that a program which sets out to encourage reflection is likely to need more, not less, organization, than one in which "traditional disciplines are permitted to hold sway" (p. 35). Thus, unless resources are provided initiatives in this direction are likely to be short-lived (Goodman, 1988). Ross (1990) agrees, arguing that the present 'university culture' retains a technical rather than a reflective orientation within teacher education by limiting resources such as, course funding, instructional time, and institutional rewards.

Isolation from the practice setting

A further barrier to the development of reflection on campus is the difficulty in communicating to students what it means to be reflective about their practices until they actually begin teaching (MacKinnon & Erickson, 1988). Instruction can sensitize a beginner to aspects of practice, but real learning occurs in the action setting (Yinger, 1990). Learning in action settings is the essence of Schön's (1987) thrust for reflective practice. This thrust is also taken by Fullan and Connelly (1987) in their report on Teacher Education in Ontario:

> Theories of child development, methodologies for teaching and for the organization of subject matter, history and sociology of education and so forth should not, we believe, be taught as separate courses but should, instead, be woven into the fabric of a program conceptualized primarily as a practicum" (p. 46).

The programmatic responses to this dilemma are varied. Some universities are experimenting with their entire teacher preparation programs off-campus, dovetailing classroom experience with on-site classes (Hundley, 1990). Other programs are experimenting with arrangements that put university personnel within schools on a full-time basis during student practica (Wilson, 1990). Yet, other programs are opting for early field placements. In a study of students undertaking early field placement, Denton (1982) demonstrated that their experience helped them to place subsequent course work in a meaningful context. However, Erdman (1983) suggests that such placements often cast the student in the role of 'teacher's aide' rather than a reflective learner, and therefore are utilitarian in their orientation.

III. The off-campus component - The practicum

Once the students are on practicum, a number of other factors have been suggested that either enhance or constrain student-teacher reflection (Boydell, 1986; Wildman, Magliaro et al., 1990; Wildman & Niles, 1987). Indeed, students soon discover that the school environment was not always conducive to reflective practice.

Educational Leadership

Students quickly realize that they work not only in classrooms, but also in large bureaucracies (Crow, 1987). There are many social, political, and practical forces which may buffet the would-be reflective voyager:

Institutional constraints create an environment which almost seems to work against a teacher's attempt to have serious and rigorous discussion. These constraints are, moreover, part and parcel of the teacher's knowing-in-action and reflection-in-action and cannot be set aside . . . (Kilbourn, 1988, p. 20).

School bureaucracies often exercise tight control over many aspects of the practice setting which is, at times, in direct conflict with notions of teacher autonomy and, as such, constrain reflection (Hayes & Ross, 1988; Kilbourn, 1982; Pugach and Johnson, 1990; Schön, 1988). Wildman and Niles (1987) suggest that relinquishing aspects of control may be one of the most difficult accommodations for facilitators of reflection.

Further, Ross (1987), Wildman and Niles (1987), and Ross and Hayes (1988) argue that unless school leadership directly supports professional development efforts that value teacher input, encourage collegiality (as opposed to contrived colleagiality - Hargreaves, 1989) and seek continuous improvement then reflective practice is likely to be severely constrained. This applies to both the experienced practitioner and the student-teacher on practicum. Further, as Wildman and Niles (1987) observe: "If administrators do not have similar levels of knowledge, skills, and understanding about the reflective process, they can knowingly or unknowingly construct barriers" (p. 28). Thus, these authors contend that administrators will have to develop radically different conceptions of how teachers function in schools if the notion of teachers as reflective practitioners is to become commonplace.

The norms of teaching

Another constraint on reflection is the powerful norms that pervade teachers' lives. These norms often run counter to conceptions of professional growth and development (Cormin & Bowman, 1988; Feiman-Nemser, 1983; Lieberman & Miller, 1984).

Thus, the norm of *practicality,* characterized by the separation of theory from practice, learning the 'tricks of the trade,' and learning by 'trial and error,' is likely to inhibit reflection on substantive issues (Crow, 1987; Cole, 1989; Nolan & Huber, 1989). The norm of *self-sufficiency,* characterized by 'not asking for help', non-interference, and physical isolation, prohibits many forms of collaborative inquiry, knowledge sharing, and peer support, which is regarded as an important component of reflective practice (Comeaux & Peterson, 1988; Feiman-Nemser, 1986; Hayes & Ross, 1988; Houston & Clift, 1990; Lieberman, & Miller, 1984; Nolan & Huber, 1989). The norm of *routinization,* characterized by batch processing, technical problem solving, and the impersonalization of the teaching task, results in teachers reverting to models of past experience rather than reflecting upon the idiosyncratic features of their present situations and devising appropriate solutions (Gilliss, 1988; Glickman, 1985; Nolan & Huber, 1989). Perhaps one of the most powerful norms is that of *maintaining the status quo* which encourages acquiescence and conformity to current school practices. School systems often reward consistency, stability, and alignment with the values of the organization. Thus, maintenance of the status quo can be incompatible with professional autonomy and problematizing one's own practice (Wildman & Niles, 1987)

The time press

Another element of the practice setting that confines reflective practice is the 'time press' that that many teachers experience in school settings:

> Classrooms are complicated and busy settings . . . The sheer number and pace of events call for quick and decisive actions. The workday offers little time to unravel the complex causes of the reality teachers face (Feiman-Nemser, 1986, p. 516).

The lack of time available for reflection is frequently cited as a major obstacle to the development of reflective practice (Campbell et al., 1990; Comeaux & Peterson, 1987; Feiman-Nemser, 1983; Houston & Clift, 1990; Niles, McLaughlin, Wildman, & Magliaro, 1989; Nolan & Huber, 1989; Ross, 1990; Tabachnick et al., 1979; Wildman & Niles, 1987). For instance, Pugach

and Johnson (1990) caution that "reflection is not likely to be a natural outgrowth of a system in which time is an unavailable resource to classroom teachers" (p. 205). Cole (1989) and Nolan (1989) suggest that it is not sufficient to provide time for reflection but to also allocate resources for students, teachers and advisors to become familiar with what it means to be reflective. Wildman and Niles (1987) suggest that 20-30 hours are needed to assist teachers in moving to a stage of independence with this sort of activity and a further 20-30 hours spent on its practice. Gilliss (1988) warns that most school administrators are unlikely to provide sufficient time for this to occur.

Tabachnick et, al. (1979) argue that the fragmented structure of the school day also prevents students and teachers from engaging in any substantial interactions with their pupils. Interactions tend to be brief and impersonal, and unlikely to provide students with valuable feedback or alternative perspectives for viewing their practice.

A utilitarian emphasis that pervades the practice setting

A factor which further constrains the development of reflective practice is the utilitarian emphasis that pervades the practicum setting. Often the practicum setting promotes the development of utilitarian teaching perspectives (i.e., a 'what works' approach) amongst students to the exclusion of ethical, social, or political considerations (Comeaux & Peterson, 1988; Goodman, 1988; Zeichner, 1980). Other studies have demonstrated that students move towards a more custodial orientation during their practicum, and readily equate success in teaching to order and discipline in the classroom (Feiman-Nemser, 1983, 1986; Glassberg & Sprintall, 1980; Tabachnick et al., 1979; Zeichner, 1980, 1987). Therefore, researchers have questioned the wisdom of extending the time spent on practicum if, as these authors suggest, it only serves to perpetuate existing institutional and professional norms (Beyer, 1984; Brown, 1990; Feiman-Nemser, 1990; Stout, 1898; Tabachnick et al. 1979; Wideen et al., 1987). Zeichner (1980) contends that the more time spent on practicum does not necessarily mean that the students will be more reflective:

Consequently, proposals which 'solve' problems of teacher education by merely scheduling more student time in classrooms rests upon the

apparently untenable assumption that more time spent in that way will automatically make better teachers (p. 51).

In similar fashion, Feiman-Nemser (1990) argues that it is not the amount of time spent on practicum that is important but how that time is spent.

Beyer (1984) suggests that while the replication of current school practices might be laudable in certain circumstances, there is a danger that students will accept as unproblematic certain educational 'givens' and in this sense the practicum experience is likely to be "miseducative, since it cuts short the possibility for further education and growth" (p. 37) while perpetuating utilitarian attitudes. While 'survival' and 'technical know-how' are often foremost in the mind of novices, students must be encouraged to move beyond utilitarian concerns to substantive classroom issues; for example, pupils prior knowledge and it's manifestation within classroom discourse (Campbell, 1986, cited in Wideen et al., 1987; Feiman-Nemser, 1983; Gaskell, 1985; MacKinnon & Erickson, 1988).

The utilitarian emphasis might be overcome if, as Houston and Clift (1990), Shulman (1986b), and Noordhoff and Kleinfeld (1990) suggest students are encouraged to develop a broad and in-depth knowledge of what is happening in the classroom, the milieu of the school, and the community at large. Wildman and Niles (1987) suggest that an important component of this process is the need for students to express the specific events they wish to subject to analysis. Thus, observational skills and the ability to describe the various settings in objective terms rather than judgemental terms are viewed as precursors to the development of reflective practice (Kilbourn, 1982; Nolan & Huber, 1989)

Encouragingly, Peterson and Comeaux (1987) found that in an analysis of student and sponsor discourse almost twenty per cent of the comments moved beyond factual accounts of classroom practice and into hypothetical, justificatory, or critical reflection.

Limited control over curricula practices or teaching content

Student-teachers find themselves in teaching situations where most classroom activities have been determined prior to their arrival (Tabachnick et al., 1979). Thus, they often lack any authority over the curricular practices or content for which they are responsible during the practicum (Zeichner, 1987). While strong leadership from supervisors is important, unless students are able to exercise some control over content, and the way which that content is presented, then student-teacher reflection will be constrained.

IV. The triadic relationship

The triadic relationship within the practicum setting is an area that has received a great deal of attention in the literature. The following review examines seven aspects of this relationship: trends in the supervision of student-teachers, new roles for students and sponsors, selection of sponsors and advisors, commitment to reflection, student evaluation, triadic instability, and differences between school and university cultures.

Trends in student-teacher supervision

Historically the relationship between students and supervisors has been dominated by an apprenticeship training model (Boydell, 1986; Brown, 1990; Gaskell, 1985; Zeichner, 1987a; Zeichner & Liston, 1987). Under the apprenticeship model, students are expected to observe and imitate the practices of a 'master' teacher. Activities for the student are carefully prescribed in advance, allowing little individual discretion on the part of the student during either the design or implementation phases (Kilbourn, 1982; Zeichner, Liston, Mahlios & Gomez, 1987). The role of the faculty advisor is to determine the success or otherwise of the students efforts. Typically, this assessment is based upon two or three student-observation visits. May and Zimpher (1986) argue that the apprenticeship model "reflects a positivist view in that the primary source of learning and teaching is by imitation and modelling" (p. 88). This strictly top-down linear supervisory model has been rivalled recently by more collegial forms of supervision (Bolin, 1987; Houston and Clift, 1990), the most common being clinical supervision *á la* Goldhammer (1969) and Cogan (1973). Three aspects differentiate this model of supervision from the apprenticeship model: 1) the focus of the classroom observation is negotiated by the triadic members, 2) the methods for objective

data collection are agreed upon by all members of the triad, and 3) the student is invited to join with the sponsor and advisor in the interpretation of the results following the classroom observation (Acheson & Gall, 1987).

Widespread use of the clinical supervision model has resulted in a variety of interpretations within the practice setting. Hunter (1984) and Joyce and Showers (1982) use it as a form of technological intervention specifically aimed at enhancing teacher effectiveness. Others have utilized elements of the clinical supervision cycle to bring an inquiry-oriented focus to the practicum setting. For example, Holland (1989a) has noted that Garman's use of clinical supervision:

> . . . at its highest levels moves beyond the data of classroom observation to attend to the mutual discovery of the meanings and potential of both the supervisor's and teacher's professional practice (p. 366).

Likewise, Kilbourn (1982) emphasizes autonomy, evidence, and continuity within a clinical supervision model to ensure mutual reflection and understanding for each of the practicum partners. Despite these recent variations, May and Zimpher (1986) and Smyth (1989a) have argued that many educators have still imbued clinical supervision with positivist notions of standardization, quality control and homogenization of pedagogy; "the medical metaphor 'clinical' connot[ing] something in need of careful diagnosis and a prescribed course of action toward improved 'health'" (May & Zimpher, 1986, p. 88). Other researchers have suggested that clinical supervision has become a sophisticated mechanism for teacher inspection and surveillance and that current usage emphasizes an overly narrow and technical view of teaching (Doyle, 1990; Garman, 1990; Smyth, 1989a).

Ross (1990), Simmons, Sparks, and Colton (1987) and Houston and Clift (1990) consider that if reflective practice, as outlined by Schön (1983), is to be realized then an alternative relationship is required to that which is typically associated with the apprenticeship and clinical supervision models. Notions of linear supervision and collegial assistance need to be replaced by a concerted collaborative endeavour grounded in reflective inquiry (Garman, 1986; Sergiovanni, 1985; Tom, 1985). For Donald Schön (1988), "both the

reflective teacher and reflective coach are researchers in and on practice whose work depends on their collaboration with each other" (p. 29). Both sponsor teacher and faculty advisor must carefully attend to the appreciative system that students bring to the practice setting. Holland (1989a) and Sergiovanni (1985) argue that in this sense the interaction between student and supervisors allows for a shared interpretation of meaning that each person assigns to classroom events. Further, the interplay between student, sponsor, and advisor becomes a constructivist activity grounded in the student's own inquiry into his or her practice and is informed by the sponsor and advisor's experience and knowledge. This form of reflective inquiry is broader than that usually associated with clinical supervision in that it considers cultural contexts, unintended consequences of action, and student values as they impact upon the practice setting (Houston and Clift, 1990). Clearly, a practicum relationship grounded in reflective practice makes very different demands upon each participant as opposed to other supervisory relationships (Hayes & Ross, 1988; Nolan & Huber, 1989; Zeichner & Liston, 1987).

New roles for the student and the supervisors

The student is expected to be both proactive and interactive, not merely reactive (Zeichner, 1987a). Wildman and Niles (1987) have warned that while it is tempting for the other members of the relationship to 'speed up' reflection by doing the reflection for the student, the pace of reflection must be governed by the student. In this sense, it is important that the student be encouraged to listen to his or her own 'voice' (Cole, 1989; Comeaux & Peterson, 1990; Hayes & Ross, 1988; Holland, 1989a). Wildman and Niles (1987) contend that when the student is encouraged to do this the 'locus of control' remains with the student and the process becomes internalized. Richards et al. (1989) suggest that students with an internal 'locus of control' believe that they are in control of themselves and their actions. By contrast, prospective teachers who maintain an external 'locus of control' are more likely to attribute their teaching successes or failures to forces beyond their control, for example, fate, luck, or chance.

As the role of the student teacher is redefined within the triadic relationship, so too are the roles of other participants. Wildman and Niles

(1987) propose that both sponsor teacher and faculty advisor "must constantly . . . counsel each other to listen and facilitate rather than talk and dominate" (p. 30). When sponsors and advisors adopt such a stance, and encourage students to listen to their own 'voice,' it is incumbent upon them to ascertain the student's appreciative system, that is, the way in which a student perceives the teaching-learning relationship. Once ascertained the sponsor and advisor must consider how it might be similar to or different from their own appreciative systems, and carefully monitor changes in both as the relationship between the participants grows and develops (MacKinnon & Erickson, 1988). The development of common understanding between participants is critical for reflection (Ross, 1987). Unless this occurs the process is likely to be in jeopardy from the outset (MacKinnon, Kuhn, & Gurney, 1988; Schön, 1987).

Pugach and Johnston (1990) believe that a collaborative approach also increases the likelihood of private 'internal dialogue' being made explicit, public, and thus available for joint reflection. For example, while the student may be making sense of the practice situation, both sponsor and advisor may be rediscovering 'what it is that they know' and 'how they have come to know it,' and be willing to share it with the other members (Garman, 1986; Holland, 1989a; MacKinnon et al., 1988; Niles et al., 1989; Wildman et al., 1990). Wildman and Niles (1987) in considering the role of the sponsor and advisor, suggest that the understandings that they have of their own classrooms is often more utilitarian than analytical because they themselves have had few opportunities to build up objective accounts of classroom life. Thus, as the teacher and advisor begin to observe novices in action, and to share their own ideas, they are likely to reflect extensively upon their own practice. Erickson and MacKinnon (1991) have reported this trend in a study of the relationship between a sponsor teacher and his student-teacher:

> . . . experienced teachers in our group actually found it easier to unpack their own knowledge and understanding in the context of working with a novice teacher. This situation often required them to make explicit both the procedures and actions that they engaged in (which were often routine and tacit in nature) as well as the rationale for doing them. This act of making one's knowledge explicit and providing reasons for one's

behaviour rarely occurs in the normal activities and routines engaged in by a teacher (p. 9).

In this manner, the triadic relationship may serve as a reflective vehicle and educative opportunity for all participants (Boydell, 1986; Emans, 1983; Nolan & Huber, 1989). This is of particular importance given that sponsor teachers often perceive their interaction with student teachers as an important form of professional development. These interactions are often perceived to be of greater value than, for example, in-service programmes, contact with building principals, or membership of professional associations (Wideen et al., 1987). Thus, there is value for all participants in such a relationship. Under these circumstances, the potential for students to be reflective in a collaborative relationship is likely to be greater than that afforded by other supervisory models described earlier.

Selection of supervisors

A triadic relationship grounded in reflective inquiry is dependent largely upon the sponsor and advisor for its success. Unfortunately few opportunities are available for practitioners (i.e., sponsor teachers and faculty advisors) to develop as reflective practitioners. Zeichner and Liston (1987) lament the apparent lack of support given to sponsor teachers and faculty advisors in this important aspect of their own professional development. Two major factors appear to hinder the development of reflective educators for use in supervisory relationships: 1) the *ad hoc* selection of the sponsor teachers, and 2) the transitory nature of the faculty advisors (Ross, 1987; Zeichner & Liston, 1987). Sponsor teachers are rarely selected because of their potential as reflective coaches. More often their selection is based upon criteria such as 'Who has the lightest load?' or 'Whose turn is it this year?' (Goodlad, 1988; Stout, 1987). Ideally, sponsor teachers should be selected from outstanding practitioners who are able to help students reflect upon tacit knowledge and translate it into discursive forms (Erdman, 1983). Zeichner and Liston (1987) suggest that until sponsor teachers receive some form of reward, recognition, or time compensation for their involvement in the supervision of student-teachers, faculties of education are unlikely to have much impact upon *present* supervisory practices let alone on the introduction of alternative practices.

Similarly, the appointment of faculty advisors is often less than satisfactory. Many are graduate students for whom their involvement in the supervisory process is often more related to financial needs than to an over-riding interest in the professional development of student-teachers. Even then the recognition or reward for services rendered is relatively meagre (Ross, 1987; Zeichner & Liston, 1987). Also, advisors who are with the program for only one or two years are unlikely to become familiar with sponsor teachers or the school environments in which the student-teachers are placed (Erdman, 1983). Furthermore, the transitory nature of advisors makes it difficult for program co-ordinators to ensure continuity between course and field work from year to year (Ross, 1990). In short, the *ad hoc* selection of sponsor teachers and the transitory nature of faculty advisors limits the likelihood of either being committed to, or even having a knowledge of, reflective practice. Therefore, the development of reflective facilitators for use in practicum settings is a critical problem facing inquiry-oriented teacher education programmes (Stout, 1989).

Commitment to reflective practice

Lack of commitment to a triadic relationship grounded in reflective practice has numerous consequences. Clearly, in any reflective endeavour there is an element of personal and professional risk. This underscores the need for a safe and supportive relationship within the triad which will engender a sense of trust and professional respect for opinions of it's individual members (Erickson & MacKinnon, 1991; Houston & Clift, 1990; MacKinnon & Erickson, 1988; Ross, 1987; Ross & Hayes, 1988; Wildman & Niles, 1987). Goodman (1983) warns that unless these conditions are met the process may be detrimental to the development of reflective practice:

> It is difficult under the best of conditions for individuals to question their beliefs and to explore the implications of their actions. Challenging students to reflect upon their experience and ideas must be done with sensitivity and respect for the individuals. If healthy dynamics are not established, challenging students to think may result in defensiveness, not insight (Goodman, 1983, p. 48).

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A triadic relationship grounded in reflection would permit dissent and conflict, interactions which are unlikely to be condoned in other supervisory relationships. Nolan (1989) suggests that such an environment needs to be nurtured over time, and that it may take up to five or six reflective inquiry cycles before students are willing to raise issues. This highlights the need for commitment by all participants to the process over a sustained period of time (Kilbourn, 1982). And commitment in this sense means more than just the occasional classroom visit by the sponsor teacher or faculty advisor. Housego (1987) notes that sponsor teachers do not always place a high priority upon the observation of student-teachers and, furthermore, that faculty advisor visits tend to be even less frequent (sometimes as few as three over a thirteen week practicum). Occasional drop-in visits or impromptu discussions are unlikely to engender the sort of trust and confidence necessary for students to 'open up', to take risks, and to address substantive issues (Hayes & Ross, 1988; Houston & Clift, 1990); nor are they likely to be conducive to the development of 'common meaning' between all parties (Ross, 1987). Furthermore, drop-in visits are unlikely to "honour the context of events leading to that point [in time]" (Kilbourn, 1982, p. 3). Drop-in visits, therefore, constrain any collaborative endeavour, or joint reflection.

Student evaluation

Evaluation also impacts upon the degree to which the practicum setting provides an atmosphere conducive to student-teacher reflection. Nolan (1989) questions the dual roles of collaborator and evaluator which are often assigned to teachers and advisors. He argues that students are unlikely to expose themselves to situations of uncertainty and confusion (which the literature suggests are characteristic of reflective practice) if an evaluative component is present within the practice setting. Gurney (1989) observes that while the practicum should be "a low risk environment where one is free to experiment" (p. 25), the evaluative component turns the practicum into a 'proving ground' rather than a 'training ground.' This problem is confounded when, as Gurney (1989) reports, "the faculty advisor is seen as an evaluator for whom special lessons are prepared" (p. 22) rather than as a coach in a joint learning endeavour. In a similar study, Cole (1987) found that student teachers saw their sponsor teachers as a source of advice for

solving immediate problems of practice but their faculty advisors as evaluators of performance.

While it is not possible to completely eliminate evaluation, some researchers have suggested ways in which its impact upon the practicum setting might be reduced. In one study, Partington (1982) found that when the assessment role was assigned to the sponsor teacher, rather than the faculty advisor, students exhibited far less anxiety. Others have suggested that if faculty advisors were to become more intimately involved in the practicum setting their role would be perceived by students as something other than evaluation (Gurney, 1989). Comeax and Peterson (1990) and MacKinnon and Erickson (1988), in acknowledging that the practicum inevitably results in an evaluation of students, have suggested that one way to counteract this apparently disabling feature is to explicitly include the students' reflective efforts in their overall evaluation. Thus, elements of reflective practice such as confusion, doubt, and self-questioning, would be viewed as positive indicators of professional development rather than disabling factors.

Triadic instability

The relationship between student, sponsor, and advisor has also been the focus of several studies which have argued that the triad is an inherently unstable structure; that participants seek greater dyadic balance at the expense of triadic cohesiveness (Emans, 1983; Yee, 1968). Studies have indicated that the student and sponsor teacher often form a close alliance distancing themselves from the faculty advisor (Brown, 1990; Keliipio, Prentice, Shapson, Sprungman, Squire, Steinman, Toms, & Wideen, 1990). In such instances, the sponsor teacher is often regarded as supportive while the faculty advisor is perceived as being 'critical' (Wideen et al., 1987). Unfortunately, being supportive has often resulted in a conscious avoidance of any form of conflict, or discourse, on potentially difficult topics (Housego, 1987; Tabachnick et al., 1979). An alliance along these lines is unlikely to engage the student in a discussion of substantive issues related to teaching; discussions which are central to the notion of reflective practice. Boydell (1986) has offered a slightly different interpretation to explain the apparent isolation of the faculty advisor:

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The assumption underlying much current practice is that teaching is best learned by observing practitioners, by serving an apprenticeship with a "good" teacher . . . Such an approach implies an essentially passive role for the [faculty advisor] as someone who must not interfere "with the guidance of the master and his apprentice" (Stone, 1984, p. 21, in Boydell, 1986, p. 115)

Boydell (1986) contends that a relationship along these lines often negates what the student might have learnt while on-campus and the potential contribution that a faculty advisor is able to make. Once again, the ineffectiveness of the faculty advisor is likely to constrain collaboration and reflective inquiry in ways similar to that described in the previous example.

The isolation of the faculty advisor is also apparent when student-teachers' report on their practica experiences. Campbell, Green, and Purvis (1990) have noted that faculty advisors are rarely mentioned, suggesting that advisors play a minimal role in a students' perceptions of their practica. This seemingly minimal role calls into question the whole notion of the university's role in the practicum setting. Several researchers have argued that faculty advisors often have to 'play out' a social role during each visit, re-establishing their relationship with the student and sponsor each time, thus leaving little time for substantive discussions with either party (Boydell, 1986; Emans, 1983, Zeichner et al., 1987). When this is combined with Boydell's (1986) concern that advisors tend to tread warily when on the 'sponsors turf,' it is not surprising that a faculty advisor's contribution is sometimes minimal.

The difference between school and university cultures

Some studies have indicated that the lack of clarity of triadic participant roles is a result of poor communication between faculties of education and the schools (Applegate & Lasley, 1982; Housego, 1987; Wideen et al., 1987). Simmons et al (1988) and Brookhart and Loadman (1989) have argued that in order to overcome this confusion universities and schools need to acquire a bi-lingual and bi-cultural capacity. Support for such a position may be found in a recent study by Keliipio et al. (1990) who have noted that it was the values embedded in the two cultures that gave rise to the most critical

incidents faced by students as they struggled to walk "the line between discrepant school associate and faculty associate expectations" (p. 11). For example, Keliipio et al. (1990) found students were resistant to the faculty advisors' expectations that they 'routinely reflect upon their teaching' when such a practice was neither displayed by, nor expected of, the sponsor teachers supervising their practica. Brookhart and Loadman (1989) observe that triadic relationships displaying collaborative efforts often worked to bridge the gap between these two cultures. Emans (1983) and Boydell (1986) propose a re-conceptualization of the faculty advisor role within the practicum. They suggest that the faculty advisor remain involved in practicum but be given:

> . . . less direct responsibility for immediate supervision of students, working instead in an inservice mode with teachers on curriculum development and the improvement of teaching, focusing on the interpretation of theory and research that constitutes the knowledge base of education (Boydell, 1986, p. 123).

Thus, the faculty advisor's influence would be directed more towards the sponsor teacher and indirectly upon the school environment. Gaskell (1985) hopes that this might encourage 'a tilt towards pedagogical inquiry' within schools, a disposition which the student-teachers in his study felt was lacking at both professional and institutional levels during their practica. Emans (1983) has warned that there will be considerable resistance to such a proposal, not only from administrators and curriculum personnel (who are not accustomed to having university personnel intimately involved with their operations) but also from faculty advisors themselves "who often show little interest in contributing to, or even using the knowledge, that comprises professional education" (p. 17).

V. Programmatic responses to enhance reflective practice

The review, so far, has highlighted a number of factors that either enhance or constrain student-teacher reflection. In response to these factors, several teacher education programs have introduced strategies specifically to to address one or more of these factors. This section of the reviews those strategies. The review is divided into four parts: an overview of the strategies, common themes among the strategies, on-campus strategies for

enhancing reflection, and off-campus strategies for enhancing reflection. The off-campus strategies are divided into two groups: those within, and those beyond the triadic relationship.

An overview of the strategies

Reflection has become an important, if not primary, component of many teacher education programmes (Zeichner, 1987b). Attempts have been made to enhance reflection both on-campus (course work) and off-campus (the practicum). But, as Wildman and Niles (1987) have argued, reflection will not "happen simply because it is a good or even compelling idea" (p. 29). Nor, as Goodman (1983) has suggested, and Zeichner et al. (1987) have demonstrated, simply having reflection as a program goal will not ensure its manifestation in a student's teaching practice. To this end, a number of programmatic initiatives have been introduced to enhance student-teacher reflection.

Many programs employ several different strategies. For example, the Reflective Program in Teacher Education (RITE), University of Houston, uses individual journal writing, micro-teaching, and ethnographic studies (Freiberg and Waxman, 1990). The Professional Teaching Program (PROTEACH), University of Florida, emphasizes action research, dialogue journalling, and faculty modelling (Ross, 1990). The Teacher for Rural Alaska Program (TRA), University of Alaska - Fairbanks, teach cases and use video tapes for stimulated recall (Noordhoff & Kleinfeld, 1990). In the elementary student-teaching program at the University of Wisconsin, Zeichner and Liston (1987) use a combination of action research, ethnographic and curriculum analysis projects for enhancing reflective practice. In the elementary program at Knox College, Illinois, students undertake ethnographic studies in an attempt to problematize their practice and to uncover the 'educational givens' within local school settings (Beyer, 1984).

Figure 1 depicts one way of categorising the various programmatic responses to reflection. The categories are based upon the level at which the activity occurs (e.g., on-campus or off-campus) and the participants involved in the activity (e.g., the student or members of the triad). Further, when the responses are grouped in this way the importance of contingent factors that

have already been discussed (e.g., trust and support, access to alternative perspectives, or student voice) become even more apparent. Finally, it must be noted that the distinctions made between the categories are for descriptive purposes only; there is considerable overlap across categories.

Common themes

Underlying the majority of programmatic attempts to enhance reflective practice are four common themes. The first is the notion of *making explicit* issues and problems that one encounters, or arise as a result of, working in the practice setting (Cole 1989; MacKinnon, 1987; Ross, 1990; Russell et al., 1988; Segiovanni, 1985). Cole (1989) argues that "inquiry into one's own practice must begin with an explication and examination of the foundations on which practice will develop" (p. 20). Coupled with making explicit, is the second theme of *'giving reasons'* for one's actions (Kilbourn, 1988; Ross, 1990; Schön, 1988; Shulman, 1987, 1988). Shulman (1988) argues that:

> It is not enough merely to celebrate the reasons for the student's judgement or actions. Our obligations are not discharged until what is reasoned has been married to what is *reasonable* (p. 34).

A third common emphasis is the notion that *knowledge is socially constructed;* that it is time bound, and culture specific, rather than 'certain' (Kilbourn, 1988; LaBoskey & Wilson, 1987; MacKinnon, 1989; Ross, 1987). A final, emphasis is the need for a *common pedagogical language,* a lingua franca, to assist communication between students, faculty, and school personnel (Freiberg & Waxman, 1990; Hayes & Ross, 1980; MacKinnon et al., 1988; Ross, 1987; Russell et al., 1988; Simmons et al., 1988). It is this common language that Shulman (1987) believes is important for gaining insights into, and relating the wisdom of, practice to novice teachers.

On-campus strategies for enhancing reflective practice

On-campus strategies are typically associated with course work. For the purposes of this review they are grouped under the following headings:

Enhancing Reflective Practice

Common Themes

- Making Explicit the Foundations on One's Own Practice
- Giving Reason for One's Actions
- Knowledge As Being Individually Constructed andSocially Mediated
- Development of a Common Pedagogic Language

Strategies

On-Campus   **Off-Campus**

Knowledge Base
- Content
- Pedagogic
- Curricular

Research
- Curriculum
  Development
- Critique

Modelling
- Faculty

Elicitation
- Vignettes
- Interactive Videos
- Teaching Exemplars
- Teaching cases
- Micro-teaching
- Seminars

Within the Triadic Relationship
- Coaching and Modelling
- Dialogue Journalling
- Reflective Interview
- Stimulated Recall Interview

Beyond the Triadic Relationship

Ethnographic
- Case Studies
- Narrative

Action Research
- Individual
- Peer Collaboration

Reflective Writing
- Journal
- Autobiographic

Curriculum Analysis

Figure 1. Strategies for enhancing reflective practice.

knowledge base, research, modelling, and elicitation.

Knowledge base

The on-campus strategies for enhancing reflection can be broken down into four sub-categories. The first is the knowledge base that students draw upon and construct as they participate in teacher education programs. Kilbourn (1988) has argued that the quality of a student's reflection is influenced by the relative sophistication of the knowledge base he or she brings to the teaching environment. Houston and Clift (1990) concur, and add that a student's knowledge base affects his or her appreciation of the pupils' understanding and the choice of appropriate instructional strategies. Shulman (1986a, 1986b, 1987) suggests that the requisite knowledge base for teaching includes: *subject content knowledge* - understanding not only "that something is so, but why is it so, and on what grounds its warrant can be asserted" (1986b, p. 9); *pedagogical content knowledge* - "the ways of representing and formulating a subject that make it comprehensible to others" (1986b, p. 9); and *curricular knowledge* - "the pharmacopia from which the teacher draws those tools of teaching that present or exemplify particular content and remediate or evaluate the adequacy of student accomplishments" (1986b, p. 10). Noordhoff and Kleinfeld (1990) have suggested that limited knowledge means that pre-service teachers may not adequately 'read' many of the variables in the practicum setting. In a study of pre-service teachers Borko et al. (1988), have noted that a strong content knowledge base resulted in students being more responsive to pupils' needs. Upon noting that few students possessed extensive pedagogical knowledge, they concluded that students should be placed in their preferred subject areas during practica so that the majority of their time may be spent developing pedagogical knowledge rather than content knowledge.

Research

A second strategy for enhancing reflection is to engage students in some form of on-campus research. Zeichner (1987b) and Ross (1987) propose that students be involved in *curriculum development projects* to demonstrate the active role that teachers can play in the development of the curriculum. They contrasted this with the dominant view of teachers as merely implementors of the curriculum. Stout (1989) suggests a second form of student research

would be a *critique* of the literature on reflection so that they may come to an understanding of the underlying principles of reflective practice.

<u>Faculty modelling</u>

A number of researchers have emphasized the importance of *faculty modelling* for enhancing reflective practice (Campbell et al., 1990; Ross, 1990; Ross & Hannay, 1986; Valli, 1990; Zeichner & Liston, 1987). Ross (1987) suggests three guide lines for modelling reflective practice: 1) provide an example of problem setting by sharing, publicly, decisions made about substantive issues, 2) communicate to the students the perception that knowledge is uncertain at times, and 3) demonstrate competent action through personal performance. Ross and Hannay (1986) have argued that faculty modelling is a crucial step in encouraging students to be reflective:

> If university instructors, while overtly advocating reflective inquiry, model passive and expository instructional techniques, then how can change be facilitated? Rather than being a link in a continuing chain of passivity, the university should provide an interactive and critical model of pedagogy . . . In other words, this approach to teaching must become the normal way of conceptualizing practice rather than a verbalism used in university classrooms (p. 12).

Campbell et al. (1990) add that students may not always be aware when an instructor is modelling a particular strategy and that there may be occasions when students need to be told what an instructor is doing and why.

<u>Elicitation</u>

The final on-campus category encompasses a number of approaches which might be best labelled as elicitation strategies. Kilbourn (1988) and Wildman et al. (1990) suggest that *vignettes* are one way of enhancing reflection-on-action where the reading, listening and discussion of stories gives the students vicarious experience. Noordhoff and Kleinfeld (1990) and Wildman et al. (1990) have used selected *interactive videos* and *cases* in a similar fashion to present "a complex and difficult situation as a source of deliberative material" (p. 176); using these students learned how to spot central issues, to frame problems, and to suggest solutions. Gurney (1989) and

MacKinnon and Erickson (1988) have used what they call *pedagogical exemplars*, typically video tape and in-class demonstrations, to stimulate students' curiosity and to elicit the students' notions of 'teaching' and 'learning.' The vicarious experience provided by video, cases, and exemplars has the immediacy of the teaching situation but without the press for action that accompanies the 'real' world of practice. Freiberg and Waxman (1990) have adopted a modified form of *micro-teaching* to provide students with an opportunity to elicit feedback, and provide an opportunity for self-assessment. They contend that the combination of experience and reflection results in professional growth. Finally, on-campus *seminars* run concurrently with teaching practice are useful for encouraging student-teachers to reflect upon their practice (Goodman, 1983). Goodman claims that the seminar plays three important roles, each of which contributes to a student-teacher's professional development: a liberalizing role, a collaborative role, and an inquiring role.

Off-campus strategies for enhancing reflective practice

Off-campus strategies are generally associated with the practicum and with activities within and beyond the triad relationship. This review first examines the activities within the triad, and then those beyond the triad. Within the triadic relationship there is one area discussed, that is, strategies based upon the interaction between student, sponsor, and advisor. Beyond the triadic relationship four groups are discussed: ethnographic research, action research, reflective writing, and curriculum analysis. Each of these strategies engages the student as researcher into his or her practice, and the 'cultural milieu' in which his or her teaching takes place (Houston & Clift, 1990).

Within the triad

Four programmatic strategies were identified for enhancing reflective practice within the triad: coaching and modelling, dialogue journalling, reflective interviews, and stimulated recall interviews. Each of these strategies is describe below.

Coaching and modelling. Gurney (1989), MacKinnon et al. (1988), Wildman et al. (1990), and Schön (1987, 1988) describe a form of *coaching*

whereby both sponsor teacher and faculty advisor *model* reflective practice in the supervisory relationship. In Schön's (1988) words:

> One person helps another learn to practice reflective teaching in the context of doing . . . demonstrating reflective teaching in the very process of trying to help the other learn to do it. (p. 19)

Schön (1983, 1987) refers to three types of coaching: 'follow me', 'joint experimentation,' and 'hall of mirrors.' Follow me is characterized by showing and telling, joint experimentation by collaborative inquiry, and hall of mirrors by reciprocal reflection. Therefore, "from this perspective, the [student] becomes engaged in action, and reflection, assisted by a coach who scaffolds the learning-to-teach process through dialogue and modelling" (Lalik, Niles, & Murphy, 1989, p. 1). Thus, the supervisory relationship mirrors the very practice that the student is encouraged to develop in the classroom (MacKinnon et al., 1988).

Dialogue journalling. A number of researchers have referred to a second strategy within the triad called *dialogue journalling* (Clift et al., 1987; Glassberg and Sprintall, 1980; Richards & Gipe, 1987; Zeichner & Liston, 1987). This is a common strategy whereby a student records his or her reflections on a particular lesson or related activity (Ross, 1990; Zeichner, 1987b). These might be puzzles, critical incidents, or dilemmas. The journals are then periodically read by the sponsor teacher or the faculty advisor who would respond, question, and offer suggestions about the issues contained therein. Hence, a dialogue would develop within the journal which a student might reflect upon (Freiberg & Waxman, 1990). Copeland (1986, cited in Ross, 1990) has argued that journal writing contributes to the development of student reflection only when students are taught techniques (such as what questions to ask) and they have received thoughtful and meaningful feedback.

Reflective and stimulated recall interviews. The final two triadic strategies are closely linked; reflective interviews and stimulated recall interviews (e.g. using video to stimulate recall). These are designed to attend to the students' understanding of the practice situation (Kilbourn, 1988), to provide an enabling opportunity for students to construct their own meaning

(Gurney, 1989), and to encourage and stimulate students to view situations from multiple perspectives (Ross, 1990). Both strategies provide opportunities for all triad members to develop a common meaning of the events within the practice setting. Similarly, both strategies permit students to critique their own performance with input from experienced professionals (Volker, 1987, cited in Houston & Clift, 1990).

Beyond the triad

Four programmatic strategies have been reported for enhancing reflective practice beyond the triadic relationship: ethnographic research, action research, reflective writing, and curriculum analysis.

Ethnographic research. Included within this category are two strategies: case study and narrative. Shulman (1986b) has argued that *case studies* are important on two counts: 1) they help new teachers to clarify their practical arguments and 2) they highlight values and norms that operate within the practice setting. Beyer (1984), LaBoskey and Wilson (1987), and Ross (1990) have used case study assignments to highlight taken-for-granted assumptions in the practice setting, and to enable students to develop a structural framework with which to approach future problems, thus, "empowering them with the ability to become more reflective practitioners" (Ross, 1990, p. 4). Ross (1990) reports on a teacher education program at Virginia State University in which students are required to develop case studies on pupils:

> The purpose of this task was to develop their appreciation of (1) the amount of information that is available in the classroom setting; (2) how difficult it is to be aware of all this information; and (3) how important this information is in managing a classroom that provides equal opportunity to all students (p. 146).

LaBoskey and Wilson (1987) suggest that case studies serve to connect the theoretical with the experiential by encouraging teachers to identify issues of concern and to critically examine them in the light of theories examined on-campus. Connelly and Clandinin (1986) have used the term *narrative* to capture their particular use of case studies: " . . . teachers' stories are retold in the narrative account in such a way that the observed and reflected upon

events are embedded in . . . terms of unities of personal and professional experience" (p. 307). The interpretation of observed data is based on a mutual researcher-participant reconstruction of meaning-in-action, where reflection-in-action is captured by participant observation in classrooms, and reflection-on-action through interviews with participants at a later stage:

> The two practices combined, that of working with reflection-in-action and reflection-on-action, create the basis for the narrative accounts which constitute the detailed methodology for the development of theory in the narrative method . . . The development, therefore, is dialectic in the sense that we have used it; it involves the researcher and participant in a mutual development of ideas. Mutually enhanced as researcher and participant discuss and modify the participant's narrative (Connelly & Clandinin, 1986, p. 306).

Action research. Action research is defined by Zeichner (1987b) as a form of "self-inquiry by participants in order to improve their own practice" (p. 568), either individually or with peers. Tom (1984) adds that:

> . . . action researchers also believe that scientific findings cannot be converted into rules for handling every problem of curriculum and teaching strategy. Action researchers stress that every practical situation has a unique context and that there must therefore be as many research findings as there are different contexts. Thus action researchers attempt to develop context sensitive generalizations whose applicability is limited to similar local situations in the future. (p. 41)

Carr and Kemmis (1983) describe action research as a series of self-reflective cycles of planning, acting, observing, and reflecting. *Individual* action research projects therefore require students not only to examine classroom and school phenomena but also to become actively involved in the research process. Action research is "inherently a social form of research: those involved in the practice being considered are to be involved in the action research process in all its phases" (Carr & Kemmis, 1983, p. 155). Zeichner and Liston (1987) have involved student-teachers in action research projects focusing on such things as grouping strategies, levels of pupil involvement

in class, and teachers' behaviour towards high- and low-ability groups. They argue that such projects bring an inquiry-oriented focus to the school setting and encourage student-teachers to be reflective about their teaching practices.

Peer collaboration is a move away from the notion of reflection as a personal or individual act towards a more collaborative process (Comeaux & Peterson, 1988; Feiman-Nemser, 1986; Pugach & Johnson, 1990). Unfortunately, although this appears to be a desirable practice it would seem that teachers rarely have neither the time nor the opportunity to observe and conference with each other (Wildman & Niles, 1987). Schön (1983) contends that this is *prima facie* evidence for establishing institutional conditions that permit time for reflection: "A teacher's isolation in her classroom works against reflection-in-action. She needs to communicate her private puzzles and insights, to test them against the views of her peers" (p. 333). Reflective practice then is likely to be enhanced by peer collaboration because internal dialogue or conversation is made explicit and thus available for joint reflection (Freiberg & Waxman, 1990; Pugach & Johnson, 1990). The advantages of shared reflection are that both parties are likely to 'see' things that they may not have realized in their own teaching (Wildman et al., 1990). Houston and Clift (1990) argue that a sense of community, developed through collaboration, provides a supportive environment that enhances reflective activity. Pugach and Johnson (1990) encourage their students to take on either the role of initiator or facilitator in the peer collaboration process. They list four steps to guide students: 1) reframe through clarifying questions, 2) summarize the refined problem, 3) generate possible solutions, and 4) consider ways of evaluating the effectiveness of the solution chosen. Wildman et al. (1990) suggest that teachers reflect on their teaching together when circumstances such as proximity, common problems, shared theories, or social compatibility cause a bonding to develop between them. Therefore, understanding how such relationships develop might also be an important factor in facilitating reflection in schools. Finally, there is evidence that student-teachers value peer collaboration within the practicum setting. If encouraged, peer collaboration can contribute not only to the development of reflective practice, but also increase its likelihood as a career long pursuit (Campbell et al., 1990).

Reflective writing. Another common method for encouraging student-teacher inquiry is reflective writing; two common forms are *private journalling* and *autobiographical* writing (Copeland, 1986, cited in Ross, 1987). Reflective writing provides a way for pre-service teachers to practice critical analysis and reasoning (Ross, 1990; Ross & Hannay, 1986). Journal writing, beyond the supervisory triad, provides students with the opportunity to question: 1) what they know, 2) what they feel, 3) what they do, and 4) why they do it (Yinger & Clark, 1981, cited in Zeichner, 1987). In this activity students write for themselves, as opposed to 'writing for the supervisor'; it is, therefore, a very private and internally driven form of deliberation (Freiberg & Waxman, 1990; LaBoskey & Wilson, 1987; Wildman et al., 1990). Autobiographical writing is slightly different in that teachers are asked to critique their autobiographies in relation to their recent school or university experiences - similar to Connelly and Clandinin's (1986) conception of narrative but with a distinctly autobiographical orientation. The intention is to create links between the personal and professional dimensions of a student's life:

> Personal and professional knowledge need not occupy two distinct territories in a divided psyche. For one thing, such obsessive discreteness tempts the dominance of one domain over the other. Furthermore, the desire for integration, for integrity, is the individual's impetus for cognitive growth. (Atwell, 1988, p. 12)

Oberg (1990) has also used autobiographical writing as a strategy for encouraging her students to explore their professional teaching in relation to their personal histories. Students begin by initially writing about a particularly interesting classroom event and over the course of a semester explore the values, biases, and norms, that are present in their stories. The final versions are integrated personal and professional autobiographies based upon extensive reflection.

Curriculum Analysis. Curriculum analysis is another strategy for enhancing reflection beyond the triadic relationship (Beyer, 1984; Goodman, 1988). Students investigate, and reflect upon, various aspects of the curriculum. In particular, students question the origins and purposes of

curriculum, and attempt to lay out ideological and societal influences embedded within the curriculum materials. Students are challenged to relate their analyses back to their own conceptions of curriculum and curriculum development. Goodman (1988) and Beyer (1984) believe that such studies move teachers away from a passive acceptance of the curriculum, towards an active role in its design, implementation, and evaluation.

VI. The practicum as a research context for exploring reflection

While many strategies have been suggested for enhancing reflective practice, there are few systematic reviews in the literature of the success or otherwise of these strategies. Zeichner (1987b) notes that empirical evidence in support of the various strategies is surprisingly meagre. Similarly, Richards and Gipe (1987) report:

> . . . researchers say that seminars, partnership teaching, mini-ethnographic studies and journal keeping engender reflection . . . However, explicit directions for conducting these activities are not provided. More importantly, analyses of "the meaning constructed by pre-service teachers about their experiences are lacking." . . . There are a paucity of data which specifically document and examine changes in prospective teachers' concerns. Therefore, teacher educators have little measurement criteria of the educative worth of reflection. (p. 5)

Thus, it would seem that research is necessary to ascertain influences of various strategies on student-teacher reflection. Following this, there is a need to investigate how the successful strategies might be best incorporated into a teacher education program (Erickson, 1988; Houston & Clift, 1990). In terms of Schön's conceptualization of reflective practice, and the importance of action setting, off-campus strategies deserve closer research attention:

> It isn't enough to ask teachers what they do, for what they do and what they say often diverge, one must get at what teachers do through direct, recorded observation that permits a very detailed description of behaviour and a reconstruction of intentions, strategies, and assumptions (Schön, 1988, p. 9).

The practicum would be the primary focus of such attention. The importance of the practicum is further highlighted by reports that many aspiring and experienced teachers regard it to be the single most important component of their teacher education programs (Goodlad, 1988; Wideen et al., 1987). In sum, the practicum and the associated relationships that occur between students and supervisors provides a important and valuable context for investigating student-teacher reflection.

CHAPTER 4

Research Method

This chapter provides the reader with details of the research design, specifically the data capture, data collection, data analysis, and data review procedures.

I. Data capture

Two aspects of the data capture are discussed in this section: the reflective teaching cycle, and the selection of the participants.

The reflective teaching cycle

A regular teaching cycle (i.e., a student's pre-lesson discussion with a sponsor teacher, the teaching of a lesson, and a post-lesson discussion with the sponsor teacher) provided the basic structure around which the research method was constructed. Overlaid on this cycle was a series of stimulated video recall sessions in which both the student and sponsor were able to comment upon the three stages of the regular teaching cycle (see Figure 2).
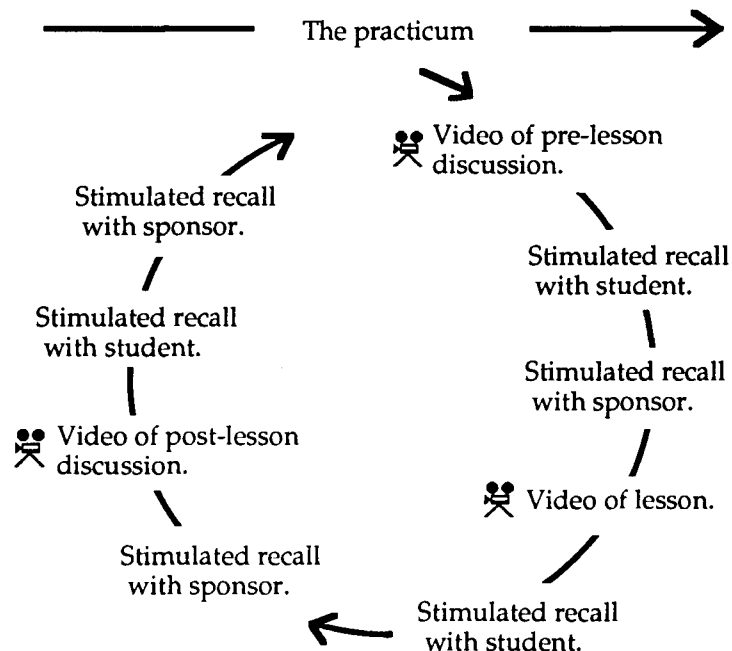
Figure 2. The reflective teaching cycle

The combination of a regular teaching cycle and the overlaid video recall sessions constitutes, in this study, a 'reflective teaching cycle.' This cycle was tested in a pilot study and found to be robust and successful in 'getting at' student-teacher reflection. The reflective teaching cycle was subsequently used to examine the reflective practices of four student-teachers as they prepared, taught, and conferenced their lessons with their sponsor teachers.

The utility of the reflective teaching cycle is that it is based upon the most predominant features of the practicum experience, that is, the planning, teaching, and conferencing that surrounds a student's lesson. These features provide critical junctures for examining student reflection in the practicum setting. This cyclic pattern allows links to be made between what the student thought might be the case prior to the lesson, what actually occurred during the lesson, and the student's reactions after the lesson.

The reflective teaching cycle has a second utility; it can be continually repeated throughout the practicum. Therefore, student-teacher reflection may be tracked within a specific reflective teaching cycle and across several cycles (Figure 3). Such tracking may provide insights into the factors enhancing or constraining reflection over the course of the practicum.

Central to the examination of reflective practice both within and across cycles is the influence of the sponsor teacher. This highlights the third utility of the cycle; it incorporates the interplay between student-teacher and sponsor teacher as they discuss the student's teaching practice. This interplay may be mapped during a single reflective teaching cycle or over several cycles to examine the role of the sponsor in relation to the reflective practices of the student. In this study five reflective teaching cycles were conducted with each student during their practica (see Figure 3). Additional semi-structured interviews were conducted at the beginning, mid-point, and end of the practica.

The participants

There were three criteria for selecting the participants in this study: that participation in the project would be voluntary, that the students

involvement would not jeopardize their practica (i.e., 'at risk' students would not be involved in the project[5]), and that there was physical space available in the schools to conduct the stimulated recall and additional interview sessions.

The Practicum

Week 1   Week 13

I = Additional Interview

⟲ = Reflective Teaching Cycle
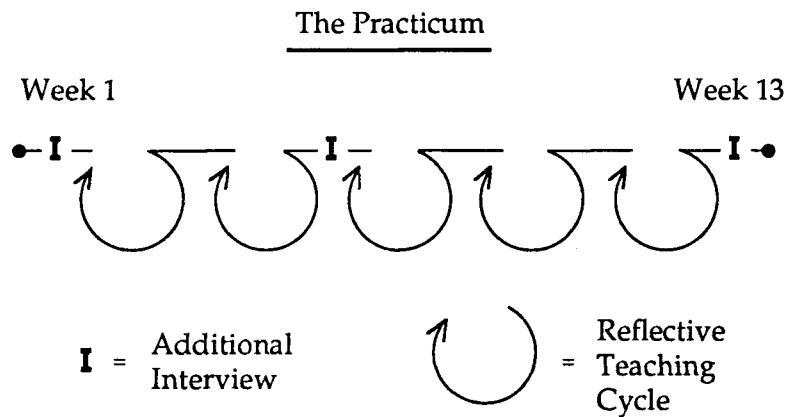
Figure 3. Reflective teaching cycles across the practicum

The Teacher Education Office and the Department of Mathematics and Science Education[6] provided the researcher with a list of eighteen students which might, if asked, volunteer for the project. Further, these students were not considered to be 'at risk' by the faculty. The researcher visited all eighteen students and their respective sponsor teachers prior to the practicum. Based upon the initial reactions of the students and sponsors to the study (i.e., their willingness to be video taped, willingness to commit time to the study, etc.) and availability of physical space within the school for taping and recording the various research sessions, four students and their sponsors were invited to participate in the project. All accepted the invitation.

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5   That is, the faculty felt there was a risk that the student may not satisfactorily complete their practicum.

6   The researcher's supervisor was from the Department of Mathematics and Science Education. Therefore, the researcher decided to use channels of communication that already existed between the Department and the Teacher Education Office for selecting the students rather than going outside the department and independently selecting the students.

II. Data collection procedures

Within the reflective teaching cycle there were nine points of data collection as shown in (see Figure 2, page 64). Beyond the cycles, there were three other points of data collection. All sessions were video and audio taped. This procedure ensured that the was a back-up tape for all sessions. The data collection procedures included:

- pre-lesson discussions between student and sponsor teacher,
- stimulated recall of the pre-lesson discussions with student and sponsor teacher, separately,
- lessons taught by the student,
- stimulated recall of the lessons with student and sponsor teacher, separately,
- post-lesson discussions between student and sponsor teacher,
- stimulated recall of post-lesson discussions with student and sponsor teacher, separately, and
- semi-structured interviews on demographic information, conceptions of 'teaching' and 'learning,' and the participants' reactions to the study.

The data collection was conducted at the convenience of the participants and with minimum disruption to normal classroom activities. Typically, a cycle was spread over three days: the pre-lesson sessions on day one, the lesson sessions on day two and the post-lesson sessions on day three. Most of the data collection sessions occurred on-site. A few of the pre-, mid-, and post-practicum interviews were conducted off-site.

Pre- and post-lesson discussions

During the recording of all pre- and post-lesson discussions, the participants were seated beside each other and the camera trained to record both participants. The researcher started the video and audio tape recording machines and then left the room before the discussions began. The participants stopped the tapes at the end of the discussions.

Lessons

The lessons taught by the student-teacher were video taped by the researcher. To ensure that the presence of a video camera created minimal disruption to the class, the researcher video taped the same classes before the project began. This enabled both the student-teachers and the pupils to become familiar with the presence of the camera and the researcher in the classroom. A parabolic microphone was situated beside the camera to enhance the audio recording. A wide-angled focus was maintained for most of the video taping. Occasionally the focus would be narrowed to capture the student-teachers' one-to-one interaction with the pupils. For the most part the camera was situated at the back of the room, although there were occasions when it was possible to video tape the lesson from other angles without disrupting the class (e.g., when the pupils were engaged in a laboratory session).

Stimulated recall sessions

The stimulated recall sessions conducted during this study were substantially different from the more traditional use of stimulated recall (Tuckwell, 1982). The primary difference in this study was that the agenda for the recall sessions was set by the participants; they stopped, started, and commented upon the sections of video tape that were of interest to them. Their **reflections** on their practice were stimulated by their own curiosity. In more traditional forms of stimulated recall, it is the researcher, not the participant, who sets the agenda. For example, the researcher might select excerpts from the video (or audio) and ask the participant to recall what their thoughts were at those points in time. Stimulated recall sessions were conducted on the pre-lesson discussions, lessons, and the post-lesson discussions.

Semi-structured interviews

Pre-, mid- and post-practicum interviews were conducted with each of the students. Mid- and post-practicum interviews were conducted with each of the sponsors. A series of questions (10 to 15) were used as the basis for the interviews. These semi-structured interviews were consistent with standard interview protocols and techniques (Mishler, 1986; Spradley, 1979).

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The pre-practicum interviews were conducted by an independent interviewer and explored the students' conceptions of teaching, learning, and learning how to teach. An independent interviewer was used so that the students would not associate the researcher with a particular line of inquiry. This was important, particularly in the early stages of the practicum, when the researcher was encouraging the participants to set their own agenda. It was less of an issue later on, when the participants were accustomed to research protocols (i.e., the students felt free to comment upon *any* issue that interested them and not just upon issues that they thought would be of interest to the researcher).

The mid-practicum interviews were conducted by the researcher, and sought to situate the participants' teaching practices in the context of their own experiences. Therefore, demographic, school, and work information were collected during these interviews.

The post-practicum interviews were conducted by a second independent interviewer. The primary purpose of these interviews was to determine any potential conflict that participants perceived as a result of the dual roles played by the researcher during the study (see Appendix A for a discussion of this issue).

Data collection report

The data collection report provides information on the success, or otherwise, of the data collection. The report also indicates the method used for designating the data tapes and transcript excerpts used in the analysis.

Successful sessions

The research design required two hundred taped sessions; fifty sessions for each student/sponsor pair. One hundred and ninety-two sessions were successfully completed. Eight sessions were cancelled due to circumstances beyond the control of the researcher. The cancelled sessions are listed in Table 1.

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Table 1. Report of cancelled data collection sessions

Cases	Cancelled Sessions
Sally	Cycle three - post-lesson discussion.
	Cycle three - recall session with Sally of post-lesson discussion.
	Cycle three - recall session with Jason of the post-lesson discussion.
Tina	Pre-practicum interview.
	Cycle five - post-lesson discussion.
	Cycle five - recall session with Tina of post-lesson discussion.
	Cycle five - recall session with Linda of the post-lesson discussion.
Jona	Cycle four - recall session with Jona of the post-lesson discussion.

The researcher felt that the eight cancelled sessions did not unduly affect the results of the study.

Data tape and transcript designations

The data tapes for the reflective teaching cycles were designated by case, cycle number, session descriptor, and tape number. Table 2 provides the list of session descriptors used in the study (the case of Sally is used as an example).

Table 2. Examples of session descriptors for the case of Sally

Session descriptor	Explanation
Pre	Pre-lesson discussion between Sally and Jason
Pre/S	Pre-lesson recall session with Sally
Pre/J	Pre-lesson recall session with Jason
Les	Lesson taught by Sally
Les/S	Lesson recall session with Sally
Les/J	Lesson recall session with Jason
Post	Post-lesson discussion between Sally and Jason
Post/S	Post-lesson recall session with Sally
Post/J	Post-lesson recall session with Sally

Within the body of this document, the same designation has been used for transcript excerpts. Included in the identification of excerpts is the page number of the transcript from which the excerpt was taken. Figure 4 provides an example of a transcript designation.

The case of Sally/Jason

Cycle one, tape two

Pre-lesson recall session with Sally

Page five

Sally: That's what I thought. (S/J C1.2 Pre/S, p. 5)
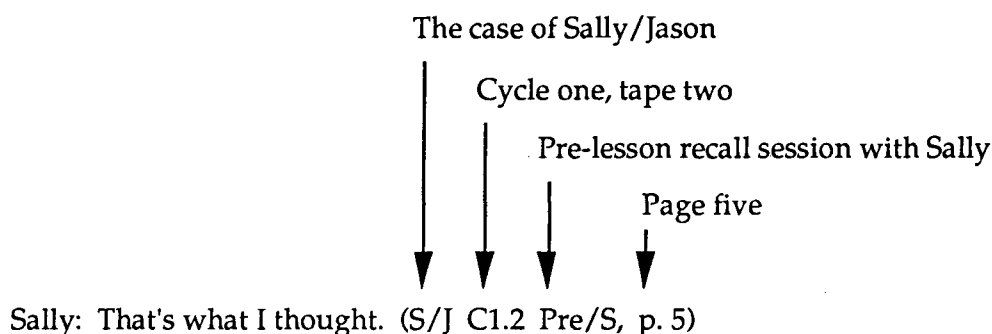
Figure 4. Sample transcript excerpt designation

The tape and excerpt designations for the additional interviews were similar to the reflective cycle designations, except the session descriptors used were 'Int I' (pre-practicum), 'Int II' (mid-practicum), and 'Int III' (post-practicum).

III. Data analysis

The data analysis is based upon the constant comparative method (Glasser & Strauss, 1967; Lincoln & Guba, 1985) and draws upon the work of Donald Schön (1983, 1987) to analytically examine student-teacher reflection in the practicum setting. There were four levels of data transformation (Novak & Gowin, 1984): production of verbatim transcripts, identification of the individual components of reflection, identification of reflective themes, and categorization of dominant trends and patterns.

Transformations

The first level of transformation was the verbatim transcription of the data tapes. In the case of the lesson tapes, only excerpts relating to the stimulated recall discussions were transcribed.

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The second level of transformation involved the identification of the individual components of reflection (i.e., precipitants, frames, reframes, and plans for future action). Instances of framing were flagged and then the dialogue which followed, both within the cycle and in succeeding cycles, was examined for instances of reframing. In some cases, what was initially identified as a frame was subsequently identified as a reframe. In these cases the dialogue preceding the reframe was scrutinized for instances of framing. As frames and reframes were identified, the circumstances in which they occurred were examined to identify what precipitated these events.

The third level of transformation was the identification of reflective themes, that is, the linking together of the individual components of reflection. Once the themes were identified the incidents of framing and reframing were more closely examined, within the context of the events that surrounded them, to determine the factors that seemed to enhance or constrain reflection. Particular attention was given to factors such as:

- the time of day,
- the extent to which the sponsor shared the teaching responsibilities,
- the number of classes taught by the student,
- the age group of the pupils,
- the content of the lessons,
- the roles of the participants,
- the ethos of the school,
- the curriculum orientation, etc.

At the fourth level of transformation, factors and themes were categorized according to dominant trends and patterns. Claims emerging from the study are based upon the transformations made at this level.

The first three levels of transformation are reported in the individual case study chapters. As such, the case study chapters provide an overall picture of student-teacher reflection. Indeed, the chapters stand alone, in and of themselves, as examples of reflection in the practicum setting. The fourth level of transformation is reported in the final chapter. The organization of

the chapters in this way has been quite deliberate. The independent nature of the four case study chapters allows for one or other of the chapters to be omitted yet the claims in the final chapter to stand, virtually, unaltered.

V. Data review

Two methods were used for reviewing the different phases of the data analysis throughout this study: a member check and an audit trail.

Member check

An important part of the research method was member checking. All participants were sent three separate mailings of their respective case study chapters (the third mailing also included a copy of the final chapter, that is, the conclusions and discussion). In some cases, phone calls and visits to schools augmented this process. Each mailing represented the progressive development of the case studies and incorporated changes that the participants suggested to earlier drafts. In some cases, substantial rewriting was required; in other cases only a few changes were necessary. Suffice it to say that the final analysis that appears in this document concurs with the participants' interpretation of the events that were reported. (Two additional outcomes of the member checking process, although not directly related to the research questions, are reported in Appendix B).

Audit trail

To ensure that all possible care was taken in the analysis of the data an audit trail was maintained throughout the analysis. The audit trail existed at four levels. The first level was the full transcription of the data tapes. Details of any activities that occurred during the tapes, and which were relevant to the dialogue therein, were also noted. The second level of the audit trail was the 'story boarding' of specific incidents identified in the reflective teaching cycles. The third level was the development of detailed theme maps (of which highly abstracted versions appear at the beginning of the case study chapters). The fourth level was the linking and recording of the reflective themes as identified from the theme maps. At all levels of the audit trail, dialogue, associated commentary, themes, etc., were annotated with a code that indicated the origin of the each element. The audit trail ensured that the lines of inference from data to results were available for review and revision

at all times. Thus, the audit trail was an attempt to account for the progressive development of the data analysis. Every attempt was made to ensure that all potential themes were fully explored before being rejected or accepted as reflective themes. Further, all aspects of the audit trail were shared with either independent researchers or participants in the study, and there was a consensus among these groups that the lines of inference from data to results were both reasonable and fully documented.

CHAPTER 5

The Case of Sally

The results and analysis of the data are presented in four chapters, one for each case study: Sally (chapter five), Tina (chapter six), Steve (chapter seven), and Jona (chapter eight). All four chapters have a common structure. Each begins with a 'theme map' that sketches the number and duration of the reflective themes that were identified in the case. The theme maps provide the reader with an overview of what is to follow. The reflective themes are then examined in greater detail; for example, the precipitants, frames, reframes, and plans to guide future action, are presented through the use of transcript excerpts. Also, factors which enhanced or constrained reflection and related issues are highlighted at the end of each theme. When a particular factor or issue occurred in more than one theme, it is noted in the first theme only and not repeated in subsequent themes in the case (e.g., the use of video tape). Each chapter concludes with a summary table of the salient points from the case. The summary tables allow the reader to review each case at a glance.

I. Introduction

This case study is based upon the practicum experiences of Sally, a student engaged in her professional year of teacher education at the University of British Columbia. Sally was born on the West Coast of British Columbia in a small fishing community. She attended the local elementary and secondary high schools before moving to Vancouver to undertake a B.Sc. in Chemistry at UBC. Following graduation Sally entered the secondary teacher education program in the Faculty of Education. For her practicum, Sally was assigned to a senior high school in a suburban district of Vancouver. Her prime teaching responsibility was for International Baccalaureate (IB) Chemistry classes at Grade eleven. Sally also taught Biology to Grade 11 and Science and Technology to Grade 10. Sally's sponsor teacher was Jason. Jason had taught for sixteen years and was head of the science department at the school. He had supervised five student-teachers prior to Sally.

II. Analysis

Four reflective themes were identified during the analysis: teaching orientation, passive interaction in discussions with the sponsor teacher, pupil learning, and collegial interaction in discussions with the sponsor teacher. Figure 5 maps the duration of the four themes across the practicum. For example, Sally's reflection upon pupil learning extended across four reflective teaching cycles, beginning in the first tape of second cycle ('2.1') and extending through to the post-practicum interview ('III').

Reflective themes	Reflective teaching cycles				
	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5
1. Teaching orientation	1.1 ●————————————————————● III				
2. Passive interaction		1.8 ●——————● 2.7			
3. Pupil learning		2.1 ●————————————————● III			
4. Collegial interaction			3.3 ●——————————● 5.8		

Note: The numbers on the time lines refer to the first and final transcript excerpts used to identify a particular theme. For example '3.7' identifies the seventh tape of the third cycle, and 'III' identifies the third tape of the additional interviews.

Figure 5. The case of Sally: Reflective theme map

Theme one - Teaching orientation

Sally was particularly interested in the constructivist approach to teaching and learning. This had been a strong emphasis in her science methods courses at UBC. In the first two weeks of the practicum, she tried to incorporate these ideas into her teaching. For example, Sally devised a number of novel demonstrations to elicit the pupils' prior conceptions of chemistry phenomena. However, she soon discovered that the combination of designing and preparing 'constructivist' lessons was a very time consuming task. By the end of the second week Sally was unable to devote the time necessary to incorporate these sorts of activities into her lessons.

Indeed, most of her time was spent 'boning up' on the content (often till two o'clock in the morning!). In the first reflective teaching cycle (week three of the practicum) there was evidence of a marked shift away from a constructivist teaching approach towards a more traditional teaching approach. The language that Sally used to describe her practice was indicative of this change. She spoke more in terms of telling rather than listening to the pupils. As Sally reviewed her lesson in the first reflective teaching cycle she referred to it as being primarily teacher-centred:

Sally: It will be more just from me to them. (S/J C1.1 Pre, p. 2)

Sally was conscious of her shift towards a teacher-centred orientation and after the lesson commented that she should have elicited more information from the pupils rather than just giving them the answers:

Sally: [In future] I think I would ask them a few questions, 'Why is this sort of thing happening'; try to put a seed in their mind to generate a few more answers.   (S/J C1.4 Les/S, p. 4)

Jason also noticed the teacher-centred orientation that had begun to characterize Sally's practice:

Jason: I would have had a bit more input from the class into what I was going to put in the notes . . . there is nothing wrong with the approach that she took, it's just that it is a bit more of a straight lecture approach. (S/J C1.5 Les/J, p. 9)

The classes surrounding and including the second teaching cycle displayed further evidence of a shift towards more traditional teaching practices. Sally used the term 'lecture' ("I wasn't about to stop the lecture." - S/J C2.6 Post, p. 1) and Jason used the term 'university' ("It's almost university style" - S/J C2.6 Post, p. 6) to describe her practice. The pupils also began to compare Sally's teaching to their perception of university teaching. Sally recalls:

Sally: One of the girls actually asked me the other day, 'Like how fast do they do this at the university?' 'It seems like we are doing twice as many notes in half the amount of time.' (S/J C2.5 Les/S, p. 6)

Thus, by the end of the second teaching cycle, Sally had recognized and framed her practice in terms of its teacher-centredness or its 'university' orientation.

By the third reflective teaching cycle Sally was quite alarmed at the growing discrepancy between her intellectual beliefs about teaching, and her actual practice. Her dismay increased when Jason indicated that he was going to focus upon Sally's classroom questioning practices in the following lesson.

As Sally reflected upon the difference between her practice and her beliefs she recognized the powerful influence that her former teachers had, both at school and university, in shaping her current practice. She then reframed her current practice not in terms of its teacher-centredness but in terms of 'teaching as she was taught':

Sally: I was thinking last night, I am not doing half the things I want to.
Tony: In regard to what?
Sally: In regard to teaching style, getting things across.
Tony: Really?
Sally: Like looking at their past knowledge, and stuff like that. Ideas. Like, I was starting to do that at the beginning. I was looking at what their ideas were, and trying to relate it to their life. Now, I find that I am just so caught up with the mechanics of just knowing the material and stuff, that I am not thinking of those considerations. It just sort of struck me yesterday at the end of the [pre-lesson] tape . . . I am not doing any of the things I believe in. I'm not. I'm like zero. Like none! None of them!
Tony: Where did you get the information about what you are supposed to do?

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Sally: I don't know? Just from all the POT[7] lectures, and listening to Bruce[8], and reading literature and stuff like that. Things that you are supposed to do in science education to help them learn. The most effective ways for them to learn. Thinking about it, I'm not doing any of that. I am basically teaching how I was taught, for a lot of it.

Tony: What do you mean by that?

Sally: I am teaching the same style, for a lot of it, that I have been taught in my past career. Going through the material.

Tony: When you were a learner?

Sally: When I was a learner. (S/J C3.2 Pre/S, p. 1)

In wondering aloud why it was difficult for her to supplant the practices of her former teachers with the practices that she had been exposed to at UBC, Sally offered four explanations: the mechanics of the classroom teaching; insufficient preparation time; her unfamiliarity with a constructivist learning environment, and the need for a personal support system to sustain an alternative teaching orientation:

Tony: Can you wonder out loud why that might be? Is it the mechanics you said?

Sally: I think it is the mechanics, and partially being so rushed, but partially not thinking about it, and making a conscious effort to do it because, right now, it's just not natural for me. I haven't seen it done all that much, and it's not an experience that I am familiar with.

Tony: Does Bruce give you any hints about how to keep that going?

Sally: No. [Well,] 'Be a reflective teacher and write in your journal every day.' [laughs]

Tony: Do you do that?

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7   An acronym for Principles of Teaching.

8   Bruce Gurney was Susan's principal science method lecturer at UBC and also a strong advocate for a constructivist approach to teaching and learning. [Note: Brian's name is used with his permission.]

Sally: I have never been able to write a journal, I tried to write a diary when I was a teenager and wanted to save all those precious things.

Tony: Same here.

Sally: It's like, after two weeks it dies.

Tony: So what plans have you got for the future then?

Sally: I think I am going to write big notes to myself somewhere, or something; like:

> Q. 'Are you *doing* this?'
>
> A. 'No, you are not!' [laughing, as she responds to her own question]
>
> Q. 'Are you doing it because you don't think it works?' [pause] 'Do you think it is useless?' [pause] 'Are you doing it because you are lazy?'
>
> A. 'Because you are lazy, probably [laughs][9]. Because it makes sense to you intellectually that this should work. (S/J C3.2 Pre/S, p. 1, emphasis in original)

After the practicum, Sally recalled the third reflective teaching cycle as a 'crisis-point' in her practicum:

Sally: I don't know, I reached a few little mini-crisis points during the practicum. It was quite good. Like thinking back on what I thought learning was all about and how things should be done, it was like 'Oh God, I am not doing any of it, I've turned into my past teachers.' It was a horrible moment when I realized what was happening because I was so caught up in the ritual of it all; of going through and getting the stuff, and teaching it. Damn it! . . . For a part of it I definitely became the teachers I have had . . . Not the good ones. I don't know why? I wasn't doing the things that the teachers who have impressed me

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[9]   Sally's claim that she was 'lazy' needs to be understood in the terms of her the practicum as whole. Typically, she would work until one or two in the morning 'boning up' on the content. This left very little time or energy for Sally to consider teaching strategies that would match her 'intellectual beliefs' about teaching and learning. Sally was anything but lazy!

most have done; those [teachers] were few and far between. I was going by the norm. (S/J Sally Int III, p. 8)

And finally, Sally noted how difficult it was to overcome the teaching practices she had been exposed to as a pupil:

Sally: I had to keep reminding myself. It didn't come readily to me. I was falling back on techniques that I have been taught or exposed to, more than going ahead with new ideas that I thought were really good ideas. (S/J Independent Int, p. 2[10])

In sum, through the supervisory practices of her sponsor teacher and her own reflection, Sally confronted the discrepancy between her beliefs and her practice. She recognized that her orientation to teaching had become one of default rather than choice. Sally had sub-consciously duplicated the practices of her former teachers. This recognition was a critical point in Sally's practicum and thereafter she critiqued her practice in terms of these two different orientations to teaching.

Review of theme one - Teaching orientation

Sally's reflection on her teaching orientation was precipitated by a discrepancy between her intellectual beliefs about teaching and her actual teaching practice. At UBC, Sally had been exposed to a constructivist teaching philosophy which placed the pupil at the centre of the teaching/learning enterprise[11]; a view to which Sally subscribed. An important aspect of this philosophy was the elicitation of the pupils' prior conceptions as a precursor to the construction of new knowledge.

In the first two weeks of the practicum Sally's practice displayed evidence of a constructivist approach to teaching. However, by the third week (first reflective teaching cycle) there had been a marked shift from elicitation of

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[10] An independent interview that was conducted after the practicum as part of another research project.

[11] Constructivism asserts two main principles: "(1) knowledge is not passively received but actively built up by the cognizing subject; (2) the function of cognition is adaptive and serves the organization of the experiential world . . ." (von Glasersfeld, 1988 p. 1)

pupil responses (listening) to a lecture-style approach (telling). During the second reflective teaching cycle, Sally framed her practice in terms of it's teacher-centredness or university orientation. In the third teaching cycle, as Sally lamented the discrepancy between her beliefs about teaching and her actual practice, she reframed her teaching orientation in terms of teaching as she was taught. She suggested four reasons for this orientation: the mechanics of teaching the material, her unfamiliarity with the principles of constructivism, her need for a personal support system to support an alternative orientation, and insufficient lesson preparation time. As a result of her reflection, Sally noted that her teaching practice had become one of default rather than choice. In the fourth and fifth reflective teaching cycles she deliberately sought to alter this by defining her practice in terms of her personal beliefs about teaching.

There were three factors that appeared to enhance Sally's reflection on her teaching orientation. The first was her pre-practicum science method courses at UBC. These courses went beyond methods *per se* (e.g., demonstrations and labs) and related the methods to theoretical perspectives that underlay the use of the methods. The instructors explicitly linked theory to practice. Theory became a 'lived' experience within the courses as students were encouraged to critique the various methods presented in terms of different theoretical perspectives. Relating theory to practice, in this way, provided Sally with a heuristic for examining the relationship between theory and practice in her own teaching.

The second factor that appeared to enhance Sally's reflection on her practice was the use of video, particularly the video tapes of her lessons. Video tape provided Sally with an opportunity to review her own practice free from the 'press' of classroom teaching[12]. She was able to compare and contrast her beliefs with her practice: "I gained a real insight into how I presented myself in class . . . because I could see myself doing it" (S/J Int III, p. 4). Thus, video provided Sally with an opportunity to inquire into her

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12   Feiman-Nemser (1986) uses the term 'classroom press' to describe the complexity of classroom settings: "The sheer number and pace of events that call for quick and decisive action . . . the workday offers little time to unravel the complex causes of the reality teachers face" (p. 316).

practice in ways that may not have been possible using more traditional methods of classroom review and evaluation.

A third factor was the importance of making explicit her past experiences in classrooms and the influence that these experiences had on her present practice. It was clear that Sally's experiences as a learner influenced her teaching. By mid-practicum, Sally identified some of these influences and was able to use them as a reference for critiquing her own practice.

One factor that appeared to constrain Sally's reflection was a lack of time. She was extremely busy right throughout the practicum and felt rushed most of the time (". . . being so rushed" - S/J C3.2 Pre/S, p. 1). As her teaching load increased she found that she had virtually no time to sit and talk about her practice with either her peers or her sponsor teacher.

Finally, there were two issues which, while not directly related to the research questions, had implications for Sally's reflection on her practice. Firstly, reflection, when it does occur, did not always result in an immediate change to one's practice. For example, it was only after a considerable period of time, and repeated confrontation with visual evidence, that Sally began to alter her orientation to teaching. Thus, time and continual support were important ingredients for professional development through reflection.

The second point, which is related to the first, is that even if something makes intellectual sense, it does not necessarily mean that you will do it, or even know how to do it in the practice setting. Despite Sally's strongly held beliefs about 'good' teaching, these beliefs did not readily translate into classroom practices. Thus, making explicit one's intellectual beliefs, in and of itself, does not ensure that one will know how to incorporate those beliefs into one's practice. Therefore, it is important to problematize one's practice (i.e., examine the taken-for-granted assumptions) in relation to alternative courses of action.

Theme two - Passive interaction with the sponsor teacher
Sally's contributions to the pre- and post-lesson discussions of the first teaching cycle were minimal. When Sally did contribute it was more to

acknowledge that she had heard what Jason had said rather than to expand upon, or add to, the issues that he had raised. Sally's comments were principally in the form of 'positive minimal responses such as: "Yeah," "Ah, ha," "Really," "I see," "Fair enough," and "OK." As such these responses did not suggest agreement or understanding but rather an acknowledgement that she had heard what had been said[13].

As Jason watched the video tapes of his pre- and post-lesson discussions, in the first cycle with Sally, he was disappointed by the extent to which he dominated the discussions. An incident in the post-lesson discussion of the first cycle caused him to reflect on this dominance. Jason had suggested to Sally that she should elicit the pupils' answers to a particular problem before telling them the solution (in this case, the causes of erroneous data). As he watched this segment of their conversation on tape, he noted that he had failed to do with Sally the very thing he was suggesting Sally do with her pupils, that is, encourage active participation:

Jason: I was talking too much, I didn't give her a chance.

Tony: Oh?

Jason: I think so. Looking at this now, I feel I was talking too much and not giving her enough chance to respond . . . Perhaps, I should have said 'What would you do in future?' Treat that situation the same as I would treat a situation in a regular class, but with Sally.

Tony: So use the same techniques you would use in a class?

Jason: I don't see why not. (S/J C1.8 Pos/J, p. 1)

As Sally's watched the tapes of the pre- and post-lesson discussions she noted that she contributed very little to the conversation. She framed her role in these discussions in terms of being 'a receiver of knowledge':

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[13] Maltz and Borker (1982) define 'positive minimal responses' as nods and comments like 'yes' and 'mm, hmm.' Further, they suggest that for women a response of this type means simply 'I'm listening to you, please continue.' They argue that for men such comments have a stronger meaning such as 'I agree with you' or at least 'I follow your argument so far.' Maltz and Borker contend that these difference possibly lead to 'miscommunication' between the two groups.

Sally: I am the receiver of the knowledge. That's about it. There wasn't any interaction. (S/J C1.9 Pos/S, p. 3).

Sally appreciated the help and advice that Jason offered but noted that there were times when she wanted to play a more active role in the discussions about her practice:

Sally: 'Jason stop talking just for a few seconds every now and then.' 'Let Sally talk about something.' . . . When I had a point, and I wanted to say something, Jason wanted to tell me so much stuff that there wasn't time. (S/J C1.9 Pos/S, p. 3).

At the end of the first cycle, Sally summarized her desire for a more active role by indicating a preference for a more collegial relationship:

Sally: I would appreciate [being] more of a colleague . . . a little bit more equal. (S/J C1.9 Pos/S, p. 4)

In the second reflective teaching cycle, Jason provided an opportunity for Sally to contribute to the discussions by pausing more often when he spoke, and by inviting Sally to comment on her teaching. For example, at the beginning of the post-lesson discussion he asked "How did you feel about it?" (S/J, C2.6, Pos, p. 1); and then at the end "Anything else?" (S/J C2.6 Pos, p. 7). Sally did participate more actively but still felt she was 'receiving' Jason's point of view:

Sally: Um, I had a little more input this time than last time. But still I was receiving his view point, and having him develop things; where and how they could have been. We didn't actually work through any problems together. It was still a lot of Jason telling me 'This is what I saw," and 'This is maybe how you can do it,' which is very valid since he is like such a good teacher. But that's still how things are going. (S/J C2.7 Pos/S, p. 8)

But more often, Sally felt that she was just sitting and listening to Jason rather than actively participating. As she explored the issue of sitting and listening, she reframed her interaction with Jason not in terms of being a receiver of knowledge but in terms of being a pupil in his classroom:

Sally: I am sitting there and listening to Jason . . . The student-teacher as being a pupil of this teacher. This is what is happening here. That's what I feel. (S/J, C2.7 Pos/S, p. 8)

This reflection did not immediately alter the level of Sally's participation in the pre- and post-lesson discussions but was critical in that it highlighted for Sally the role that she had played thus far. After having reframed her interaction with John in terms of being a pupil in his class, Sally began to take a more active role in her discussion with Jason. At the end of the practicum, the combined efforts of both Sally and Jason to contribute equally to the discussions resulted in a more collegial relationship.

Review of theme two - Passive interaction with the sponsor teacher

There were two distinct phases in Sally's interaction with her sponsor teacher. The first phase was her passive participation in their discussions during the first half of the practicum; the second phase, reported later in this chapter, traces the shift to a more collegial relationship between the two. In the first phase, Sally framed her interaction with Jason in terms of being a receiver of knowledge. While she felt that receiving knowledge in the form of feedback was valuable, by the end of the first reflective teaching cycle she wanted to play a more active role in the pre- and post-lesson discussions with Jason. Indeed, Jason, himself, noted that his dominance of these discussions constrained Sally's participation in the discussions.

Although there was a more balanced interaction between the Sally and Jason in the second cycle, Sally still felt that she was mostly sitting and listening to Jason. As Sally explored this further, she reframed the problem not just in terms of 'being a receiver of knowledge' but in terms of 'being a pupil in Jason's classroom.' This was precipitated by her frustration at not having the opportunity to contribute to pre- and post-lesson discussions with Jason. Sally then revised her role in the student/sponsor relationship and

deliberately sought to interact more fully in these discussions (the results of these efforts are recorded in the fourth reflective theme - Sally's collegial interaction with Jason).

There were three factors which appeared to constrain Sally's reflection on her practice. Firstly, Sally's passive interaction with Jason. Sally listened but did not actively participate in the pre- and post-lesson discussions that occurred in the early part of her practicum. While she modified her practice in response to Jason's ideas, it was more in terms of temporary 'fixes' rather than substantive changes to her own practice. Further, when Sally was a passive participant in the pre- and post-lesson discussions with Jason, the agenda for those discussions was set almost entirely by Jason. As a result, Sally's personal concerns about her practice remained unknown to Jason. As the practicum progressed, it became apparent that Sally was less reflective about the issues that Jason raised as opposed to those that she raised. Indeed, at times, she referred to the items that Jason raised as being 'a list of negatives.'

The second factor is related to the the tacit nature of Jason's knowledge-in-action. At times, Jason seemed to find it difficult to 'make explicit' the knowledge-in-action that he exhibited in his daily practice[14]. When Jason's knowledge-in-action remained tacit then Sally's practicum tended towards 'apprenticeship' training. As a result, Sally's learning occurred more through an 'immersion' in the practice setting rather than from her pre- and post-lesson discussions with Jason. This immersion precluded the sense-making that might have come from collaborative exploration of the practice setting. (This changed significantly in the second half of the practicum as Sally and Jason's interactions became increasingly collegial.)

The final factor which seemed to constrain Sally's reflection upon practice was Jason's emphasis on experiential learning. Early in the practicum, Jason placed great emphasis upon the importance of practical experience ("Like anything else, through experience you learn the tricks" - S/J

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[14]   A difficulty which I also face, and am only too familiar with, in attempting to explain
        my own practice.

C2.6 Post, p. 3). While practice is the central component of the field experience, an emphasis on practice *per se* often precludes substantive discussions about practice itself. As a result, Jason's early discussions with Sally often remained at a level of reporting on ('This is what I saw') rather than 'inquiring into' practice ('How would you address this problem?', 'Is it similar to other experiences?' etc.)

Theme three - Pupil learning

As noted in theme one, early in the practicum Sally experimented with a number of interesting and novel approaches that actively involved the pupils in their own learning. However, by the second teaching cycle this approach to pupil learning had all but vanished. Two factors contributed to the demise of this approach in Sally's teaching. Firstly, Sally had to spend much of her time familiarizing herself with the content required to teach IB chemistry:

> Sally: Like I never heard of Graham's Law of Gas Diffusion until Sunday. Yeah, on Sunday I really learned about Graham's Law of Gas Diffusion. Like if I just had the content on the tips of my fingers it would be so much easier. (S/J C2.5 Les/S p. 29)

A second factor was the academic ability of the pupils in the IB classes. The pupils were very bright and they were quick to seize upon even the smallest flaw in Sally's teaching. For example, in the second reflective teaching cycle, Sally was explaining the different velocities that individual molecules of a gas have at a given point in time. To help the pupils to visualize the different velocities she asked them to imagine what the molecules might look like if she took a 'snapshot' of a gas:

> Sally: OK, we are going to take a snapshot of the molecules of a gas. We have the world's fastest film. What are the velocities of the molecules going to look like? (S/J, C2.5 Les/S, p. 1)

Although the intent of the exercise was clear, one of the pupils immediately noted that if it was a 'snapshot' the molecules would all be stationary and therefore their velocities would be zero. This was followed by general agreement amongst the class (and also mixed with an element of glee in

'catching the teacher out'). For an experienced teacher, an intellectual joust of this type might be welcomed, perhaps even encouraged, but for a beginning teacher the situation is quite different. Pupil challenges, of the type described, do little to bolster a teacher's confidence especially at the beginning of one's teaching career. Indeed, the effect is often the reverse.

As a result of these two factors Sally adopted a very conservative approach to pupil learning; an approach in which the concerns of the individual were subsumed under whole-group instruction. As Sally reflected on her orientation to teaching - 'teaching as she was taught' (see theme one) - she also reflected on her current approach to instruction and framed it in terms of 'going through the material':

Sally: I am teaching the same style, for a lot of it, that I have been taught in my past career. Going through the material. (S/J C3.2 Pre/S, p. 1)

This generic approach to pupil learning, characterized by whole-group instruction, virtually eliminated pupil interaction with the teacher. 'Going through the material' or 'covering the material' was perhaps the safest way for Sally to approach teaching given the difficulty of the content and the pupil's readiness to challenge her teaching:

Sally: It puts me a little bit more on my guard. I am not as ready and open to be spontaneous and just say anything. I know that if I slip up, for sure one of them is going to catch me. Which is good. It is good that they are questioning and they are thinking and are on their toes. But it makes it a little bit more difficult for me. So the material is a strain in the first place, but then having that on top of it! (S/J C4.5 Les/S, p. 3)

Sally's use of whole-group instruction as a 'safety device' was also noted by Jason during the fifth cycle:

Jason: I think that she has a tendency to have very teacher-centred lessons, which is a safe approach. (S/J C5.2 Pre/J, p. 6)

At the end of the practicum, Sally critiqued this generic approach to teaching. She drew upon her own experiences as a pupil to argue that learning should be a personally integrated and meaningful experience:

> Sally: I have heard that 5% of what you get in school actually sticks with you. And I really believe that. I was just thinking of the things that I have really learned and that have stayed with me. Learning has to be a personal thing. It has to be integrated into you. It has to mean something to you. It has to be important. You have to make connections into your life. (S/J Sally Int III, p. 4)

Sally then argued that whole-group instruction failed to provide this; indeed, it had an inappropriate focus in that learning tended to be content-centred rather than pupil-centred:

> Sally: If I went and asked them now, some of it would come back to them but so much of the learning that is done for tests. That is all it is done for. That is one of the biggest problems that I have with the high school curriculum. That the things that we teach them aren't necessarily valuable to them unless it is just a step for them from high school to university, and onto a job, a doctorate, to teach, or whatever. The fact that content is not valuable. And I am finding myself as a teacher of information. (S/J Sally Int III, p. 6)

Sally suggested that pupil learning could be personalized and made relevant to the pupils by 'threading' real life experiences into the content:

> Sally: In any subject, I think you can sneak in interesting parts. Like we were doing this part on moluscs, and since I grew up [on the coast] I have millions of stories of going out to the beach with my Dad. Of octopuses. Like the time an octopus actually bit him. And stuff like that. I managed to thread some light in every now and then to the content. I don't have a story for

everything that I have to teach, but finding real life things that work into their lives, or work into your life, I find that helps. (S/J Sally Int III, p. 6)

Finally, she summarized the more traditional 'covering the material' approach to pupil learning as akin to covering a class with a big bed sheet which effectively covers or masks individual pupil learning:

Sally: I hate that. Covering. The big bed sheet image over the students. There, its covered! (S/J Sally Int III, p. 7)

This theme represents an important development in Sally's appreciation of her own teaching practice. In theme one, Sally made problematic her teaching orientation. In this theme, she considered an important aspect of that teaching orientation (i.e. pupil learning) and began to devise strategies for addressing this aspect of her teaching.

Review of theme three - Pupil learning

The third reflective theme traced Sally's reflection on pupil learning. This reflection was precipitated by Sally's earlier reflection on her teaching orientation (in which Sally recognized that she was teaching as she was taught). Sally framed her approach to pupil learning in terms of 'going through the material' or covering the material, an approach in which the concerns of the individual tended to be subsumed by whole-group instruction. Two factors contributed to Sally's use of this approach to pupil learning: the level of knowledge necessary to teach IB Chemistry, and the academic ability of the pupils taking IB Chemistry. With regard to the former, Sally was unfamiliar with the content and spent most of her time 'boning up' on Chemistry; this left her with little time to consider alternative strategies to traditional classroom practices (e.g., whole-group instruction). In the latter, the pupils, because of their high academic ability, always enjoyed an intellectual joust whenever the occasion arose; though well meaning, they were quite merciless in this regard. The combined pressure of these two factors severely curtailed Sally's attempts to cater for pupil learning as it pertained to a constructivist approach to teaching: ". . . the things you are supposed to do in science education to help them learn" (S/J C3.2 Pre/S, p. 5).

At the end of the practicum, Sally reframed her approach to pupil learning not in terms of going through the material or covering the material but in terms it being a personal and individual activity. She likened the going through the material to covering the class with a bed sheet which masked individual pupil differences from the teacher. To overcome this, Sally argued that classroom instruction needed to be personally relevant to pupils and integrated into their daily experiences.

Finally, there was one factor that appeared to constrain Sally's reflection upon her practice: her unfamiliarity with the content material. The practicum is, by it's very nature, a threatening situation for beginning teachers and difficulty with content compounds this situation. Sally's preoccupation with content limited her inquiry into practice and reduced the range and scope of her reflection on her practice.

Theme four - Collegial interaction with the sponsor teacher
In the early part of the practicum Sally felt that her role in the pre- and post-lesson discussions had been as a receiver of knowledge and then as a pupil in a classroom. Although her contribution to the discussions during the first two cycles had been largely passive, by the third cycle Sally had begun to play a more active role. Instead of just sitting and listening, she asked questions and called upon Jason for assistance and help. Sally no longer felt that she had to go to the discussions with all the answers worked out in advance. Together the two began to share their experiences and sought solutions to the problems that they both saw as important in Sally's practice. Early in the third cycle, Sally framed her interaction with Jason in terms of it being like 'a normal conversation':

Sally: This conference could just be a normal conversation. (S/J C3.3 Pre/S, p. 3)

The sessions which followed became increasingly collegial (sharing of information) and collaborative (jointly working on problems). Neither dominated the discussions; rather both contributed:

Sally: Both of us were of talking about what was going on. (S/J C4.8 Pos/S, p. 5)

Jason felt that Sally was now actively seeking advice on certain issues and that he was providing her with an opportunity to say more. He felt that his confidence in Sally's teaching practice contributed to this:

Jason: I think that I am saying a little bit less [in this discussion] than in the first couple.
Tony: And why is that?
Jason: Perhaps I have become more relaxed and confident in what she is doing, and in what she is presenting to the students, (S/J C5.2 Pre/J, p. 6)

In a similar fashion, Sally felt that the increased collegiality was a result of her own confidence in her ability to teach, and Jason's confidence in that ability:

Sally: We are more at a 'colleague' level. I am consulting him.
Tony: Why is that?
Sally: I don't know? Perhaps, more confidence on my part, in myself, and I think that Jason has more confidence in me as well. (S/J C5.3 Pre/S, p. 3)

As Sally began to appreciate the growing collegial and collaborative nature of their interaction she reframed the relationship not in terms of it being 'a normal conversation' but in terms of 'seeing her practice through Jason's eyes':

Sally: We are both sort of discussing it on the same level. We have the same ideas about what was going on, and what needs to be fixed. We are collaborating. We both saw the same things in the lesson that didn't work. And I thought that was pretty good because I am sort of seeing things a little bit more through Jason's eyes, the more experienced teacher's eyes. (S/J C5.8 Pos/S, p. 1)

This reframing was a important point in Sally's practicum in that it signalled a shift from the pupil/teacher relationship, that had characterized her earlier interaction with Jason (see theme one), to a more collegial and collaborative teacher/teacher relationship. She did this by drawing upon the notion of different 'levels of understanding' her practice. As she contemplated her future practice she felt that her insights into her own teaching had begun to include the sorts of things that experienced teachers 'see' as essential to their practice.

Review of theme four - Collegial interaction with the sponsor teacher

Sally's interaction with her sponsor teacher during the first half of the practicum was largely passive. She politely listened but rarely participated in their pre- and post-lesson discussions. In theme two, she referred to their interaction in terms of it being a teacher/pupil relationship. In the second half of the practicum this relationship became increasing collegial. By the third cycle, Sally framed her interaction with Jason in terms of it being a normal conversation. It was clear that she no longer saw herself as just 'one of Jason's pupils.' In the weeks that followed this level of interaction became the norm. By the fifth cycle, Sally and Jason's relationship had become both collegial and collaborative; they worked together to address issues that they saw as being important in her practice. At this point, Sally reframed her interaction with Jason, not in terms of it being a normal conversation, but in terms of seeing her practice through Jason's eyes. In the process, she drew upon the notion of different levels at which one might understand practice. Sally now felt that she was on a level of understanding that approximated Jason's level of understanding teaching practice.

From this theme two factors emerged that appeared to enhance Sally's reflection upon her practice. Firstly, her active interaction with her sponsor teacher. When Sally began to interact with her sponsor-teacher in the pre- and post-lesson discussions she revealed an ability to be very perceptive about her own practice. Further, it seemed that Sally was more reflective about the concerns that she raised, as opposed to those Jason raised (which, at times, she construed as being a list of negatives). Thus, encouraging Sally to set her own agenda was a useful tactic for enhancing reflection upon practice.

The second factor was Jason's reflection on his supervisory practices. Early in the practicum, Jason, after watching video tapes of his discussions with Sally, noted that he dominated their interactions. As he explored his dominance further, he reflected on his own role as supervisor. He argued that he was failing to do with Sally the very thing that he was suggesting she do with her pupils, that is, to actively involve them in their own learning ("I should have said 'What would you do in future?' Treat the situation the same as I would treat a situation in a regular class" - S/J C1.7 Pos/J, p. 31). Jason's reflection on his supervisory practices significantly altered the way he interacted with Sally. Their discussions shifted to inquiring into rather than reporting on practice. This was significant in that it encouraged Sally to problematize her own practice.

Finally, there was a issue that while not directly related to the research questions, was related to practicum *writ large*. On several occasions throughout the practicum, and particularly during this theme, there was a remarkable similarity between the issues that Sally and Jason raised during their separate stimulated recall sessions. If, as has been indicated above, Sally was more reflective about the issues she raised as opposed to those raised by Jason, then the common perception of a supervisor as one who points out the strengths and weaknesses in students' practice may need to be reviewed. This would be an important issue for a teacher education program that sought to encourage student-teacher reflection.

III. Summary

Table 3 provides an overview of the four reflective themes in the case of Sally. The table also provides a summary of the factors that enhanced or constrained reflection, and related issues.

Table 3. Summary of results for the Case of Sally

Theme	Research Questions One and Two				Research Question Three	Related Issues
	Precipitated by:	Framed in terms of:	Reframed in terms of:	Plan for future action:	Factors which enhance (E) or constrain (C) reflection:	
Teaching orientation	Internal dissonance resulting from the difference between her beliefs and her actions	Having a teacher-centred focus	Teaching the way she was taught	To reconcile her beliefs with her actions	• Science methods courses which link theory and practice (E) • Use of videotape (E) • Making explicit past experiences (E) • Insufficient time for reflection (C)	• Reflection does not immediately alter practice • Even if something makes intellectual sense it does not mean that you will do it or even know how to 'go about' doing it
Passive interaction with her sponsor teacher	Frustration at not having an opportunity to participate in the pre- and post-lesson discussions	Being a receiver of knowledge	Being a pupil in a classroom	To develop a more collegial relationship with her sponsor teacher	• Passive interaction with the sponsor (C) • Tacit nature of the sponsors knowledge-in-action (C) • The sponsor's early emphasis on experiential learning (C)	
Pupil learning	Dismay at finding herself a teacher of content	Going through or covering the material	Learning as personally meaningful and integrated experience	To alter her classroom practices to include real life applications	• Unfamiliarity with content (C)	
Collegial interaction with her sponsor teacher	Surprise in the changed relationship between herself and her sponsor teacher	Being like a normal conversation	Seeing things through the experienced eyes of her sponsor	Shift towards a more collegial and collaborative relationship teacher	• Active interaction with sponsor (E) • Sponsor's reflection upon his supervisory practices (E)	• Similarity between the issues that both student and sponsor raise

CHAPTER 6

The Case of Tina

The structure of this chapter is identical to the previous chapter. It begins with a theme map which is followed by the individual themes and concludes with a table summarizing the salient points from the case.

I. Introduction

The second case study is based upon the practicum experiences of Tina. Tina graduated with a B. Sc. in Biology and worked for a year in a university laboratory before entering teacher education. Tina's practicum was in the same school as Sally. The school was a suburban senior high with a population of 1200 pupils. The curriculum encompassed trade school courses to International Baccalaureate courses. Tina's sponsor teacher was Linda. Linda had taught for ten years and had supervised three student-teachers prior to Tina. During the practicum, Tina taught Grade 11 and 12 Biology, Year 11 Chemistry, and Grade 10 Science and Technology.

II. Analysis

Four reflective themes were identified during Tina's practicum, namely: the ownership of one's practice, student expectations of pupil knowledge, questioning style, and off-task behaviour. Figure 6 maps the duration of the themes across the practicum.

Theme one - Ownership of one's practice

Tina's primary teaching responsibility was for Grade 11 Biology. She quickly demonstrated a solid grasp of the Biology content knowledge but faced the challenge of finding suitable classroom activities around which to structure the teaching of that content. On several occasions, Tina recognized the difficulty she faced in this regard. For example, in the first reflective teaching cycle. She commented:

> Tina: I'm not sure of the type of activity to [pause], to bring it all together. (T/L C1.1 Pre, p. 4)
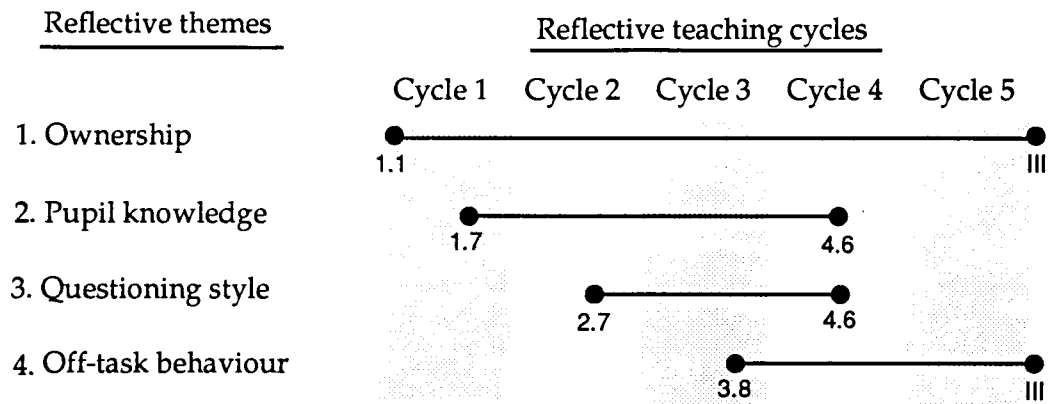
Reflective themes	Reflective teaching cycles				
	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5
1. Ownership	●————————————————————————————●
	1.1				III
2. Pupil knowledge		●————————————————●			
		1.7		4.6	
3. Questioning style			●————————●		
			2.7	4.6	
4. Off-task behaviour			●————————————————●		
			3.8		III

Note: The numbers on the time lines refer to the first and final transcript excerpts used to identify a particular theme. For example '3.7' identifies the seventh tape of the third cycle, and 'III' identifies the third tape of the additional interviews.

Figure 6.   The case of Tina: Reflective theme map

She made a similar comment in the second teaching cycle:

> Tina: Yeah, the monocots and diocots, I am not exactly sure how to introduce that. (T/L C2.1 Pre, p. 4)

As a result of her difficulty in finding suitable activities, Tina often asked Linda, her sponsor teacher, for ideas. Linda, who was a strong advocate for co-operative learning[15], encouraged Tina to experiment with this approach to her teaching. Consequently, co-operative learning very quickly became the *modus operandi* for Tina's practice. By the end of the second reflective teaching cycle, Tina had noticed the strong similarity between her own practice and Linda's practice. She framed this in terms of being a clone of Linda:

> Tina: Sometimes I feel like I'm a clone of Linda . . . So it feels like since she had this influence on me, that I am being the same as her. (T/L C2.8 Post/S, p. 4)

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[15]   An approach to leaning which encourages positive interdependence, individual accountability, and collaborative sharing amongst pupils in small group settings. See Johnson, Johnson, and Holubec Johnson (1986).

Throughout the third and fourth reflective teaching cycles, Tina experimented with a number of her own activities. Still, she found it difficult to come up with new ideas of her own and often turned to Linda for help:

> Tina: I don't know what I would have come up with on my own. (T/L C3.2 Pre/S, p. 1)

Despite the help that Linda was able to offer, she was concerned that Tina felt obliged to follow her suggestions for the classes:

> Linda: I think I try to precede everything by saying this is a suggestion, but it is already a mind set once I say it. I mean she feels obligated probably. So, maybe when you talk to her ask her how she feels about this, she must say 'Boy, she might as well teach this, she knows exactly what she wants to the last second'. (T/L C4.2 Pre/W, p. 12)

During the fourth reflective teaching cycle, Tina indicated that she wanted to be more independent of Linda and take greater control over her own practice:

> Tina: I came up with a couple of ideas that we talked about but Linda had to mould them more. If I had had time, or had done it ahead of time, and thought my ideas through . . . I might have thought how I wanted to structure them so I wouldn't be depending on her suggesting how I would implement it. . . . So, I would feel better if I had more like 'This is what I want to do.' You know? Without having to rely on her to mold it. (T/L C4.3 Pre/S, p. 1)

This desire for independence was reflected in her wish to develop activities of her own:

> Tina: Now I feel like, OK, I have this material, what do I want to do with it? Right? And one of those reasons is because I am trying to get away a little bit more from her activities of co-

operative learning constantly. So, I am trying to think of how I would want to present it. (T/L C4.3 Pre/S, p. 3)

In the fifth reflective teaching cycle, Tina had developed a number of her own activities for use in the classroom and seemed not to require as much help from Linda as on previous occasions. During the stimulated recall session of the pre-lesson discussion, Tina commented on this change:

> Tina: [Today] I was saying what I was going to do [in the class] . . . The other ones [i.e., earlier lessons] would be like 'I have an idea' and Linda would map it out. (T/L C5.3 Pre/S, p. 1)

In the the post-practicum interview, Tina reflected on this shift from dependence upon to independence from Linda and reframed her earlier notion of being a clone of Linda in terms of 'jumping through hoops.' While Tina welcomed the opportunity to imitate Linda's practice, she felt that her 'imitation' had become an 'expectation' (a criticism that Linda had levelled at her own supervisory practices in the fourth cycle). In a critique of her own practice, Tina noted that she too was making her pupils 'jump through hoops':

> Tina: There were some things that I felt really frustrated with. One was this overkill I think on co-operative learning. I did it every single class . . . Linda and I planned almost every lesson to three quarters of the way along [the practicum], and every single one of them was a different co-operative learning technique. And I agree with it and I like it. And I like the theory . . . But after a while I began to feel that I was kind of losing it. And then by having my students do it I was asking them to 'jump through hoops,' and I was feeling like I was 'jumping through hoops' as well . . . I think the students got sick of it, after a while. (T/L Tina Int III, p. 3)

Tina began to value the importance of a philosophy that was distinctly her own; one which would undergird and guide her future practice:

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> Tina: I didn't feel comfortable in my practicum in taking a strategy or method, and saying [to the pupils] 'I want you to do this because I want you to learn the definition of such and such' because I didn't feel solid enough in saying 'This is the reason why I want you to do this.' I didn't feel that I had a firm philosophy. I hadn't defined it for myself and I don't think that I have still yet defined it. But I know what I like and I know what I don't like. And I want to do a lot of reading and stuff, and writing, so that I can get that more concrete so that when I go to look at a strategy I can say *'That's me!'* and I am going to give it to them because *'I want this.'* (T/L Tina Int III, p. 11, emphasis in original)

Tina's reflection on the ownership of her teaching practice - from imitation ('being a clone of Linda') to independence ('That's me!') - was perhaps the most significant theme in this case study. Each of the other three themes contributed to this movement towards ownership and control over her own practice.

Review of theme one - Ownership of one's practice

The practicum has often been regarded as a form of apprenticeship training. Although the traditional notions of an 'apprenticeship' are no longer regarded as appropriate for inducting beginners to the teaching profession (Kilbourn, 1982; Zeichner, et al., 1987), elements of the apprenticeship model still have some use in the practicum setting, in this case, imitation[16]. Tina noted that through imitation her practice came to closely resemble that of Linda, her sponsor teacher. Tina framed this in terms of being a 'clone' of Linda. After the practicum, Tina reflected upon this feature of her practice and reframed it not in terms of 'imitation' but in terms 'jumping through hoops;' a form of compliance to external expectations rather than developing her own expectations. This was precipitated by a sense of frustration at constantly using an approach to teaching similar to that of her sponsor teacher. As a result, she decided it was important to develop

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[16] Donald Schön (1987) has argued that creative imitation "is the process of selective construction" (p. 108) and uses it to define the dominant characteristic of his 'Follow Me' model for coaching reflective practice.

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her own expectations for teaching rather than relying upon external expectations. In Tina's case, this meant defining more clearly a personal philosophy to guide her teaching practice.

Three factors appeared to enhance Tina's reflection on the ownership of her practice. Firstly, there was a student network that Tina maintained with other students on practicum. She regularly referred to, and drew upon, this network to compare and contrast her practicum experiences with those of the other students. For example, at one stage she drew upon Sally's[17] 'Jeopardy Game' rather than using Linda's 'Teams, Games and Tournaments' at the end of a unit review: "What I would like to do is to follow Sally's Jeopardy Game" (T/L C3.1 Pre, p. 7). At another time, she drew upon her conversations with other students to contrast alternative instructional methods: "I feel at this point that I have never actually stood up and done a long haul of talking, and some people on Saturday night . . . said it varies; some times it is ten minutes and some times it is up to forty" (T/L C3.6 Les/S, p. 5). As Tina drew upon these experiences and the experiences of her sponsor, she began to develop a practice that was distinctly her own.

Another factor that enhanced Tina's reflection was a common sharing of interests between herself and Linda beyond the classroom setting; for example, during workshops, extra-curricula activities, etc. These shared interests engendered a sense of trust and comfort in their relationship. This trust and comfort, in turn, allowed Tina to express more fully, and to experiment with, her own thoughts and ideas about teaching and learning. As such, Tina's relationship with Linda contributed to her reflection on the ownership of her practice.

A third factor that enhanced Tina's reflection was Linda's own reflection on her own supervisory practices. Very early in the practicum Linda, noted that she dominated the pre- and post-lesson discussions: "I just feel like when there is a pregnant pause, I jump in, a typical teacher reaction . . . sometimes when I asked her a question I started giving reasons why she might have done that; but when I ask her a question, I should just stop and let her talk"

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[17]   Sally, as in 'The Case of Sally.

(T/L C1.8 post/W, p. 4). As a result, Linda encouraged Tina to establish her own agenda during the pre- and post-lesson discussions. Thus, Linda's role in the pre- and post-lesson discussions shifted from 'reporting on' to inquiry into' Tina's practice.

Two factors appeared to constrain Tina's reflection on the ownership of her practice. Firstly, Tina's emphasis on technical problem solving as opposed to problem setting. For example, Tina often drew upon Linda's vast supply of co-operative learning activities to solve problems that she anticipated, or encountered, in the practice setting. Often the 'fit' between the problem and the solution was less than smooth. Tina tended to jettison one activity after another in search for a successful solution. It wasn't until Tina reached a point of frustration, following her 'overkill' on co-operative learning, that she began to attend more carefully to the particulars of her classroom teaching. As a result, she began to design solutions (through problem setting) that were specific to her own practice.

Secondly, Linda's 'possessiveness' of certain classes taught by Tina constrained Tina's reflection upon her practice. Specifically, when Tina began teaching Linda's Grade 12 Biology class, Linda's supervisory practices became more directive; that is, the agenda for the pre- and post-lesson discussion was mostly set by Linda. As Linda watched the video tapes of these discussions, she noted that her 'possessiveness' of the Biology 12 class interfered with her role as sponsor teacher: "I didn't give her a chance to say 'I think . . .' I guess it is because I am very possessive of my Bi[ology] 12's" (T/L C4.2 Pre/W, p. 8). There appeared to be a link between the level of 'possessiveness' as exhibited by Linda and the degree of ownership exhibited by Tina for her own practice; the less possessive Linda became the more independent Tina became. Upon reflection, Linda felt that it was important for sponsors to acknowledge that some classes were harder for her to 'hand over' to students than other classes: "When you write this up, you can say how possessive a teacher can be of something" (T/L C4.2 Pre/W, p. 13).

Finally, two issues emerged from this theme that, while not directly related to the research questions, were related to Tina's reflection upon her practice. Firstly, it seemed that Linda tended to isolate elements of her

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practice in ways that were unintentionally misleading for Tina. One way for Linda to 'survive' the complexity of teaching was to routinize activities. In her classroom, Linda set in motion complex routines with a single word or a gesture of her hand; instructions were often implied rather than stated. It seemed that information essential to the success of a particular routine or activity had become increasingly unspoken, even tacit. Thus, when Linda attempted to explain some activities to Tina she had difficulty in surfacing all the information related to the activities. This was occasionally the case with complex co-operative learning activities that Tina tried to introduce to her classes. Thus, when Linda attempted to isolate elements of her practice, particularly routines for Tina, she did so in ways that occasionally were unintentionally misleading for Tina.

The second related issue is that when reflection did occur, it did not always immediately alter practice. There were instances when both Linda and Tina reflected upon their practices (e.g., for Tina, teaching, for Linda supervision) but with no immediately visible change to their practices. Thus, time and support appear to be important ingredients for professional development through reflection.

Theme two - Expectations of pupil knowledge
Tina began the practicum with a preference for pupil-centred activities. She hoped that such activities would encourage her pupils to 'think about the work' rather than to just memorize it verbatim:

Tina: I don't want them to just give it back to me . . . I didn't want to just lecture because it [i.e., the work] is something that I cannot just say 'Read this and know it.' (T/L C1.2 Pre/S, p. 3)

Tina tried to do this by introducing a number of co-operative learning strategies to her classes in the first three weeks of the practicum. During the full-class discussions that followed these sessions, Tina was surprised when, on several occasions, she was unable to elicit the information she anticipated from her pupils; especially, when she felt the material was relatively straight forward:

Tina: It seems to me when you read it [the material] that it is
          something that could be covered quite quickly. (T/L C 1.7 Post,
          p. 1)

She felt that the problem lay in the pupils inability to draw the individual
work components into a coherent whole:

Tina: I feel right now that everything is really disjointed for them.
          (T/L 1.7 Post, p. 2)

Linda framed the problem in terms of Tina's background:

Linda: She doesn't think that there is a lot of substance in those
          chapters, and ah, because she is where she is at, and she has got
          through biology for four years at university, the stuff that is in
          the biology text is, for her I think, very introductory, very
          trivial. (T/L C1.8 Post/W, p. 1)

To overcome the disjointedness, Tina decided to provide the pupils with
more direction. This change created a dilemma for Tina. How was she to
maintain her initial commitment to 'active' pupil participation while at the
same time directing the pupils learning through activities that were
inherently 'passive.' An example of this tension occurred in the second
teaching cycle. Tina asked her pupils to group a list of terms into categories of
their own choice. The categories that they chose differed significantly from
the categories that Tina had anticipated. Tina was then caught between
wanting to 'direct' their responses ('telling them how to do it') and wanting
to elicit their responses:

Tina: I don't know how to change it? Categorizing the words; the
          problem is that since *they're* supposed to categorize it I can't
          tell them how to do it. (T/L C2.3 Pre/S, p. 5, emphasis in
          original)

As a result of this dilemma, Tina often let classroom discussions go well
beyond the time she had alloted in the hope that the pupils would eventually

produce the correct answer(s). Unfortunately, the additional time she allowed for the discussions tended to aggravate rather than alleviate the problem:

> Tina: [It was like] dragging, pulling teeth. It was just awful ... That is what I was having problems with, short of telling them what I wanted I couldn't think of anything. (T/L C2.7 Post, p. 1)

As Tina contemplated these difficulties she began to frame the issue in terms of the dominant teaching strategy she was using, in this case co-operative learning:

> Tina: Sometimes, I think that it might not be as wonderful as the intent of the whole set up is supposed to be. (T/L C3.8 Pos/S, p. 3)

Faced with these concerns and the pressure of teaching senior high classes (i.e. 'getting through the content'), Tina felt the need to move towards a more teacher-centred emphasis:

> Tina: I think it is necessary, really, really, necessary to get up there and just talk about it.' (T/L C3.6 Les/S, p. 7)

More specifically, she felt a lecture component would be useful in this regard:

> Tina: I would like to do a little bit more of a lecture ... they need someone else [other than their co-operative learning partners] to say 'This is this' and 'This is this.' (T/L C3.8 Pos/S, p. 3)

After the third teaching cycle, Tina began to experiment with lecture segments in many of her lessons. However, she was still disappointed with the pupils' responses in discussion sessions that followed her lectures:

> Tina: I don't know if it is my questions or if they don't know what I am asking them, or what I want them to know? (T/L C4.6 Les/S. p. 5)

Thus, Tina found herself in a situation similar to that which she had encountered with co-operative learning, the pupils still seemed to have trouble in arriving at the answer(s) she expected.

As Tina began to grapple with this issue, she found an incident in the fourth reflective teaching cycle to be particularly instructive in this regard. Tina wanted to review the 'scientific method' with her classes in preparation for an assignment. She anticipated this would be relatively 'straight forward,' but this was not so. She soon discovered that the pupils knowledge of the material fell well short of her expectations. As Tina reflected on this incident, she began to question her original framing of pupil knowledge, i.e., the need for more teacher-directed or teacher-centred instruction:

> Tina: The thing is, if you get up there and ask a question and you are not getting the response that you want, if you just tell them, *do they understand*? Because they haven't understood what I am trying to ask them. So, if I just tell them the answer does that click? (C4.6 Les/S, p. 11, emphasis in original)

As Tina questioned the effectiveness of the strategies she had used, she began to reframe the problem in terms of her own personal knowledge of scientific phenomena; knowledge that, for her, was relatively black and white:

> Tina: It is just black and white. It is so simple just because that is what your whole university [experience] is based around, especially in science, and to them they have no idea. (T/L C4.6 Les/S, p. 12)

This reframing brought a fundamental shift in Tina's expectations of pupil knowledge. She began to differentiate between the conceptions that experts and novices hold about various scientific phenomena. She further critiqued her expectations of pupil knowledge by noting that her assumption that scientific knowledge was relatively straight forward served only to confuse rather than clarify various issues for her pupils:

Tina: I thought about that afterwards . . I wouldn't be looking for the specific five [procedures] because that to them would be confusing. I would just say 'How do scientists work?' and then brain-storm and put them all down and then try and get the order *from them*. (T/L C4.6 Les/S, p. 12, emphasis in original)

What was critical was that Tina had begun to see pupil knowledge as being valid in its own right. She felt that her own advanced knowledge of science had blinkered her view of alternative conceptions, and pre-empted a consideration of responses that fell outside the narrow dictums of 'university' science.

Review of theme two - Expectations of pupil knowledge

At the beginning of the practicum, Tina opted for a teaching style that encouraged her pupils to be active participants in their own learning. This approach was best characterized by Tina's extensive use of co-operative learning early in the practicum. As the practicum progressed, Tina became increasingly concerned by the poor performance of her pupils in both quizzes and classroom discussions which often followed her co-operative learning sessions. Tina framed the problem in terms of the dominant teaching strategy she was using (i.e., co-operative learning). She felt a need to provide her pupils with more teacher-centred instruction to improve their knowledge. As a result, Tina introduced a number of small lecture segments into her classes.

Despite the introduction of a more teacher-centred approach there was little improvement in the pupils' performance. As Tina reflected upon this, she began to reframe the problem not in terms of teaching strategies but rather in terms of an underlying assumption that she had made about the work, namely that it was relatively straight forward. She realized that a number of the scientific concepts which she considered to be "black and white" were indeed much "fuzzier" to her pupils. Further, this assumption tended to confuse rather than clarify issues for the pupils. By problematizing her practice in this way, Tina noted that she needed to be more responsive to alternative conceptions pupils held about scientific phenomena.

Three factors emerged that seemed to enhanced Tina's reflection on pupil knowledge; the first, Tina's one-to-one interaction with her pupils. Tina's use of co-operative learning allowed her to interact regularly on a one-to-one basis with her pupils. This interaction enabled her to tap into her pupils' successes and difficulties in qualitatively different ways than might have been the case using more traditional teaching methods. This was particularly noticeable in her early discussions on teaching, for example: "I am burning that person, I don't know how long it takes the average person to copy that down, so, that is what I am really worried about doing that" (T/L C1.9 Post/S, p. 5). As a result, her early critiques of her teaching included concerns for both 'self' and 'others.' This provided different perspectives from which Tina could examine her practice.

A second factor was the Science Methods courses that Tina took prior to her practicum (these were the same as Sally's). On several occasions, Tina referred to these courses and the constructivist theory that was both presented and practiced within these courses. One instructor, Bruce, was particularly influential in this regard: "Bruce always throws out intriguing questions and then kind of sits there and waits for it; like he will throw out a thought-provoker, and everybody is like 'OK, hmmm' . . . and then everybody would start taking stabs at it left, right and centre" (T/L C4.9 Pos/S, p. 4). She used this theory/practice association to critique her own practices and those of other teachers. Examining links between theory and practice in this way gave Tina a basis for investigating and reflecting upon the assumptions that underlay different approaches to teaching and learning; for example co-operative learning versus the more teacher-centred activities that she tried in her classes.

A third factor that enhanced Tina's reflection was the tendency for post-lesson discussions to become pre-lesson discussions for future lessons. When this occurred, Tina had the opportunity to draw upon her recent practice and conduct 'thought experiments' for future practice; a transition to from 'what has happened' to 'what might happen.' In such instances, Tina's reflection was enhanced because she began to develop plans to guide her future action. A specific instance of this transition occurred during the post-lesson discussion of the fourth cycle in which Tina reflected on pupil knowledge

(See Appendix B for an excerpt of this discussion which includes the transition from 'what has happened' to 'what might happen').

One factor that appeared to constrain Tina's reflection upon her practice, was her early emphasis on content knowledge. For example, there were times when Tina presented Linda with the content for the coming lesson bereft of the structure or manner in which she hoped to teach it. For example, a comment from Linda during the third cycle highlights this: "We are planning it together but I was hoping that she would have more on paper, or more thoughts than, just, 'Here is the content'" (T/L C3.3 Pre/W, p. 2). Tina's focus on content (e.g., 'What to teach?') rather than upon broader pedagogic issues (e.g., 'How might I teach this?') constrained her inquiry into, and reflection upon, her teaching practice.

Theme three - Questioning style

At the beginning of the practicum, Tina tried a number of approaches to pupil questioning. After the first few weeks she became comfortable with, what she called, a 'free atmosphere' approach to questioning. She felt that this was an effective questioning technique because she was able to elicit answers from the pupils;

> Tina: One thing that I do notice, which I do all the time, is I don't wait for hands. I don't ask for hands . . . The thing is that I hear all these murmurings all over the place and because of that I can hear all the answers. (T/L C2.6 Les/S, p. 7)

During the second reflective teaching cycle, Linda raised two concerns about this approach; first, that often the pupils mumbled or muttered their responses; and second, it was easy for pupils to opt out of responding. Linda suggested that Tina consider a co-operative learning strategy, 'Think, Pair, Share[18]' (TPS), followed by direct questioning to overcome these problems. In reply, Tina acknowledged that her pupils mumbled but argued that this

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[18] Pupils think to themselves about a topic, they then pair up with another student to discuss it, and they then share their thoughts with the class (Kagan, 1990).

was an important element of her free atmosphere approach in that it provided a comfortable and safe environment for her pupils to respond:

> Tina: Just the way I question them . . . . I don't mind them calling out, I mean that is sort of like a free atmosphere in the classroom. They tend to mumble more now and I hear it more. Like, I ask a question and 'Blah, blah, blah,' and it comes out a little bit more. (T/L C2.7 Post, p. 5)

Linda was surprised that Tina preferred this free approach to questioning. She believed that the TPS approach would enhance not hinder pupil participation:

> Linda: It surprised me, what she said, that she likes general discussion . . . Because I don't think 'general' discussions in an open forum really work if you don't give the kids a chance first of all to discuss their answer 'in house' at their tables. (T/L C2.8 Post/W, p. 4)

Furthermore, Linda felt that by allowing responses to be muttered, Tina was failing to acknowledge each pupil's response:

> Linda: Her perception of the classroom is that 'Yeah, they are responding to me and therefore I sort of filter out their answers and I hear some of their answers but I don't hear all the answers.' But that is not acknowledging that fact that all these answers should be heard by everyone else. (T/L C2.8 Post/W, p. 6)

During the weeks that followed, Tina experimented with a number of different approaches, including TPS. As she did so a tension developed within Tina between her preferred method and Linda's suggested method. Tina acknowledged that her free atmosphere approach was not perfect but felt that TPS was not necessarily the answer either:

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Tina: I know I need a lot of work in that area but I don't know if I agree with Linda's resolution of it . . . She says when you ask a question get them to talk about it [first]. But if you ask a question and [then say] 'Talk in your groups' they just look at each other and they don't say anything or they start talking about the weekend or something like that . . . and to me that is not a solution . . . . They get so used to the opportunity [to talk] they just sit there and yak and stuff like that. I don't find it very effective. (T/L C4.6 Les/S, p. 1)

Tina also criticized her free atmosphere approach to questioning:

Tina: It is a concern with me just because it is not always effective, I have some classes I will go in there, and the atmosphere of all the classes changes; one day everybody will be with you, and it will be working really well, and you can say 'general,' and people will mutter and stuff like that. (T/L C4.6 Les/S, p. 2)

As Tina explored the issue further, she noted that she had difficulty in singling out individual pupils:

Tina: I have real qualms about singling someone out, you know, ask a question and then go pick someone out . . . I don't want to pin point people, I don't want to ask for hands. (T/L C4.6 Les/S, p. 2)

The issue of singling someone out led Tina to reframe the problem of pupil questioning not in terms of its effectiveness from a teacher's perspective but in terms of its appropriateness from a pupils' perspective. She did this by drawing upon her own experiences as a pupil:

Tina: Generally, I would only answer if I was absolutely sure, or if I was asked, but I would not just take a chance and put my hand up. *Ever!* But I would say something, I would try it. I was pretty quiet in school, but I would maybe mutter it. But I

would never sort of spit it out. (T/L C4.6 Les/S, p. 3, emphasis in original)

As Tina re-worked the issue she began to differentiate between classroom settings in which different questioning approaches were appropriate; for example, she felt when exploring a new topic muttered responses were appropriate but that singling someone out was not.

Thus, Tina, by reflecting on her preference for a free atmosphere was able to make explicit her reasons for this preference. As a result, she reframed the issue of pupil questioning in terms of the appropriateness of the different approaches from a pupil's perspective as opposed to a teacher's perspective. She then used this distinction to identify situations in which, for her, the different questioning approaches were appropriate (see Table 4).

Table 4. Tina's differentiation between questioning approaches

Classroom activity:	Questioning style:	
	Muttered response	Singling out pupils
1. When the questioning follows a teacher explanation session	✓	✓
2. When the questioning follows a revision session	✓	✓
3. Exploration of a topic using student input.	✓	X
4. Questioning in a junior high school class.	X	✓

Note: ✓ = Appropriate, X = Inappropriate

Review of theme three - Questioning style

Teachers use many different approaches when questioning pupils[19]. Typically, they favour an approach with which they are comfortable and is appropriate to the class they are teaching. In the early weeks of the practicum, Tina favoured a free atmosphere approach to questioning. With free atmosphere the pupils were not required to raise their hands nor were they singled out to respond; rather they were allowed to volunteer answers by speaking or calling them out in class. Tina framed her use of her free

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[19] See: Ornstein, (1990), Strother, (1989), and Wilen (1984).

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atmosphere approach in terms of its effectiveness from a teacher's perspective, that is in terms of obtaining answers from the pupils.

By the fifth week of the practicum, Tina's free atmosphere approach to questioning had become a feature of her practice. One characteristic of this approach that concerned Linda was the level of muttering that occurred when pupils responded to Tina's questioning. Often, it appeared that pupils muttered their responses as if to test them in the general melee of the class before committing themselves to a particular answer. Linda suggested that Tina might try a co-operative learning strategy called 'Think, Pair, and Share' to overcome the excessive muttering. Linda felt that if the pupils first aired their ideas in small group settings they might be less hesitant to commit themselves to a particular response in large class settings. Furthermore, Tina could then direct questions to individual pupils, knowing that all pupils had tested their answers "in-house" before being asked to go public. This created a tension for Tina between her preference for a free atmosphere approach and the suggested TPS approach to questioning.

For a number of weeks Tina experimented with both approaches. During the fourth reflective teaching cycle, Tina reviewed her approach to pupil questioning. TPS made intuitive sense to Tina but she felt the pupils did not take TPS seriously. Further, she felt that the problem with the free atmosphere approach was that it did not draw everybody in. At this point, Tina reframed the issue of questioning not in terms of the effectiveness of a particular strategy from a teacher's perspective but in terms of its appropriateness from the pupils' perspective. Tina drew on her own experiences as a pupil and noted that she often preferred to volunteer responses as opposed to being singled out. As she explored the issue from this perspective, she began to categorize different questioning approaches as being suitable for different classroom activities.

There were three factors which appeared to enhance Tina's reflection upon her questioning practices. The first was the use of video tape. As in the case of Sally, video tape provided Tina with an additional perspective from which to view her practice: "I think that this has made me think more about

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how I do things than I otherwise would" (T/L C4.3 Pre/S, p. 8). This was the case with different questioning strategies Tina used in the classroom.

The second factor was Tina's making explicit her past experiences as a learner. By drawing upon these experiences, Tina was able to explore alternative frames for the dilemmas she faced; for example, teacher effectiveness versus pupil appropriateness. Thus, making explicit past experiences as a learner enhanced Tina's reflection upon her practice.

The third factor that enhanced Tina's reflection was making explicit her own preferred learning style. As Tina made explicit her own learning style she examined more closely the tensions she faced in her classroom teaching. For example, while she found co-operative learning to be intuitively appealing she also had some serious questions about its use in the classroom. The following excerpt illuminates this aspect:

> Tina When I first came here, it was like, this co-operative learning is great because that is how I learn. But I think that a lot of these activities jump in before the pupils have done the first couple of steps. And I don't think that is beneficial. I know when I am studying for a test, if it is coming up quick, like as on that day, and I am still trying to read over some notes, if someone starts talking to me about the material, I get completely frustrated. And I get really uptight. And I can't do it. I haven't gotten to that stage yet: 'Just let me read it now.' So, you have to be up to a certain point before you can actually do that and I think that a lot of these activities don't plan around kids getting to that certain point. (T/L Turner Int II, p. 4)

By making explicit her own preferred learning style Tina's reflection upon her practice was enhanced.

Beyond the factors which enhanced or constrained reflection, an additional factor emerged that, while not directly related to the three research questions, did influence Tina's reflection upon her practice. That factor was

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the professional development opportunity that the practicum provided for her sponsor teacher, Linda. There were many occasions when Linda used the project as an opportunity to reflect on her own practice: "I guess because I have been doing it for a long time, seven years, these things you take for granted, and it is kind of interesting that I could actually explain it like that because I have never had to explain it to myself" (T/L C2.9 Pos/W, p. 1). Further, Linda's reflection often contributed to Tina's reflection; for example, Linda's inquiry into her own use of TPS during the pre- and post-lesson discussions enhanced Tina's reflection both within and beyond those discussions. Thus, while the primary purpose of the practicum was Tina's professional development, it also provided professional development opportunities for Linda[20].

Theme four - Off-task behaviour

During the first few weeks on practicum, Tina experimented with numerous co-operative learning activities that required the pupils to work in small groups. For the most part, the pupils worked well but on several occasions their concentration drifted to other topics (e.g., the party on Saturday night!). During the third reflective teaching cycle, the 'gossiping' of a particularly bright group of girls precipitated a discussion between Tina and Linda about off-task behaviour. As they explored the reasons for the gossiping, Tina noted that often the pupils went off-task only after they had made a reasonable attempt at the work. This created a dilemma for Tina in that she wanted her pupils to understand the work but recognized that she could not force an understanding. Tina felt that simply telling the pupils to look at the page and 'think' was not be an effective solution:

> Tina: I sort of took it, as I was walking around, that they tried it, and that they didn't understand it, and therefore they are sort of flogging a dead horse and they're not going to keep going. And other kids were still trying to decipher some, but they said that they had tried it, I mean [pause], that's what I mean you can't force an understanding of it . . . I don't believe that you

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[20] I have argued elsewhere that it is also a professional development opportunity for faculty advisors (see Clarke, 1991).

shouldn't try, but sometimes I guess you can't force it sometimes, you just can't force someone to look at a page and, you know, 'think.' (T/L C3.8 Pos/S, p. 1)

Throughout the remainder of the practicum, Tina continued to experiment with different strategies for maintaining pupil involvement in the lesson. Still, there were occasions when different pupils went off-task, the frequency of which seemed to be no more or less than one would expect in regular practica settings.

It wasn't until after the practicum that Tina raised the issue of off-task behaviour again. This occurred during the post-practicum interview. Tina contrasted her views of off-task behaviour with those of Linda's views:

Tina: One thing that I really have a problem with, in fact two: Linda's style and my own. She was having the students always on task . . .   Myself, as a student, if I am on task 75% of the time, that is a really good day. (T/L Tina Int III, p. 5)

As Tina drew upon her own experiences as a pupil she began to reframe the issue of off-task behaviour from the pupils perspective rather than that of the teacher. She felt that there were large differences between the abilities and behaviours of different pupils and that these needed to be recognized and accounted for by the teacher. Further, she felt that learning was the responsibility of the pupil not the teacher:

Tina: I mean I never had problems in school, and I was never ragged on by teachers. My friends that weren't doing as well were told to get on task, and study this and stuff. But since my marks were fine I was left alone. I day dreamed, I talked, I fooled around, I skipped class, and that is fine for certain people. I mean people here at UBC are not the norm because we have been told and told and told, even though it is kind of hard to see yourself as not the norm, but I think that goes for a lot of people - give *them* the responsibility. The more responsibility

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you have the more you will want to have; work with it. (T/L Tina Int III, p. 5, emphasis in original)

Tina argued that there was likely to be a variety of reasons for pupils going off-task and that it was quite possible for the teacher to be unaware of all the reasons. Thus, it was important for a teacher to recognize that his or her lesson was but a single event amongst many in the day-to-day lives of the pupils; therefore, to expect 100% on-task behaviour in any single lesson was unrealistic:

Tina: I don't believe in a student being on task 100% of the time in any classroom. I just don't believe it is possible at all. They are going to have off days. They are not going to be there a lot of the times in the mornings at 8.30! I just don't believe that it is real life. (T/L Tina Int III, p. 5)

Tina then noted that there was a considerable difference between a learning environment in which pupil learning was the teacher's responsibility as opposed to one in which it was the pupil's responsibility:

Tina: I think if you go at it for an idea, thinking that they have to be on-task all of the time, a student is not going to want to be in your classroom. They are going to have those days when they are just feeling sick, they might be getting a cold or something. And if you force them to do things that they don't want to do, all the time, I mean there are some things that they have to learn, but it is not going to be a very nice atmosphere to be in, I think. And like doing things, project-wise and scope-theme sort of idea they work at it at their own pace. They can work hard one day, and they can have a slower day. I think that would be a nicer way to go about it. (T/L Tina Int III, p.9)

Thus, Tina resolved the tension between wanting pupils to understand and not being able to force an understanding by arguing that responsibility for learning resides primarily with the pupils. Further, an appreciation of off-task behaviour from the pupils' perspective enabled Tina to outline briefly a

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classroom setting which would be sensitive to the needs of the pupil and also conducive to pupil learning.

Review of theme four - Off-task behaviour

Tina was interested in, and experimented with, a variety of co-operative learning activities (e.g., Jig-saw, TPS, and Round Table). Each of these activities required the pupils to work in small groups. During the second and third reflective teaching cycles, both Tina and Linda noted incidents of off-task behaviour during these activities. Often this behaviour was manifested in the form of talking or gossiping. As Tina reviewed these incidents she noted that the pupils went off-task only after they had made a reasonable attempt at the work that had been set. Tina reflected on the pupils' off-task behaviour in terms of her own teaching practice, that is, what could she do to ensure that groups remained on-task. Beyond asking the pupils to keep trying she felt she could not compel someone to look at a page and 'think.' As Tina framed the problem in these terms, she recognized the dilemma she faced; on the one hand, wanting the pupils to understand but, on the other hand, not being able to force an understanding.

There were further incidents of off-task behaviour during the fourth and fifth reflective teaching cycles. After the practicum, Tina began to reframe the problem from a pupil's perspective. She felt that learning was the responsibility of the pupil not the teacher. She reframed the issue by drawing upon her own experiences as a pupil, noting that there were many factors that affected her level of involvement in a class and that it was unreasonable to expect any pupil to be '100% on-task all of the time.'

Finally, there were no new factors identified in this theme that enhanced, constrained, or were related to Tina's reflection upon her practice.

III. Summary

Table 5 provides an overview of the four reflective themes in the case of Tina. The table also provides a summary of the factors which enhanced or constrained reflection, and related issues.

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Table 5. Summary of results for the Case of Tina

	Research Questions One and Two				Research Question Three	Related Issues
Theme	Precipitated by:	Framed in terms of:	Reframed in terms of:	Plan for future action:	Factors which enhance (E) or constrain (C) reflection:	
Ownership of one's practice	Frustration at the 'overkill' on co-operative learning	Being a clone of Linda's	Jumping through hoops	To develop a personal philosophy on teaching	• A student network (E) • Sharing of common interests between Tina and Linda (E) • Linda's reflection upon her role of sponsor (E) • Tina's emphasis on problem solving (C) • Linda's possessiveness of certain classes (C)	• Linda isolated elements of her practice that may have been unintentionally misleading for Tina • Reflection does not always immediately alter practice
Expectations of pupil knowledge	Surprise at what Tina thought the pupils would know with what she was able to elicit	The need for a more teacher-centred approach to classroom instruction	Her assumption that the work was relatively straight forward	To 'look for more' in a pupil's answer than that governed by 'university' science	•Tina's one-to-one interaction with pupils (E) • Science methods courses linking theory to practice (E) • Merging of post- and pre-lesson discussions (E) • Tina's content emphasis (C)	
Questioning style	Conflict between 'free atmosphere' versus TPS approach	Effectiveness from a teacher's perspective	Appropriateness from a pupil's perspective	To match questioning practices to classroom activities	• The use of videotape (E) • Tina making explicit past experiences (E) • Tina making explicit her own learning style (E)	• The practicum as professional development for Linda.
Off-task behaviour	Contrast between Tina and Linda's view of off-task behaviour	Not being able to force an understanding	Learning as the pupils' responsibility	To be sensitive to the pupil's needs within and beyond the classroom		

CHAPTER 7

The Case of Steve

The structure of this chapter is identical to the two previous chapters; it begins with a theme map, an explication of the themes follows, and it concludes with a summary table of the salient points. The reader is reminded that the factors which enhance or constrain reflection, and the related issues, are noted only on the first occurrence, and are not repeated if they appear in subsequent themes.

I. Introduction

The third case study is based upon the practicum experiences of Steve. Steve graduated with a B.Sc. in Biochemistry and worked for eighteen months in a commercial laboratory before entering the teacher education program at UBC. Steve's sponsor teacher, Cliff, has advanced degrees in Biology and Chemistry and had taught and conducted research at the university level prior to taking his degree in education at UBC. He was in his third year of teaching in a large suburban high school in Vancouver. The school has a reputation for being 'academic.' Cliff had supervised one student prior to Steve.

II. Analysis

Two reflective themes were identified in this case study: elicitation as a dominant classroom practice; and the ownership of one's practice. Figure 7 illustrates the duration of these themes across the five reflective teaching cycles.

Theme one - Elicitation as a dominant classroom practice

In this theme Steve reflects on his use of elicitation, first framing it in terms of its utilitarian value in encouraging pupils to work and then later reframing it for in terms of it pedagogical value in helping pupils to understand concepts. This shift was precipitated by Steve's curiosity about the pupils' ability to 'intuit' information rather than being told information.
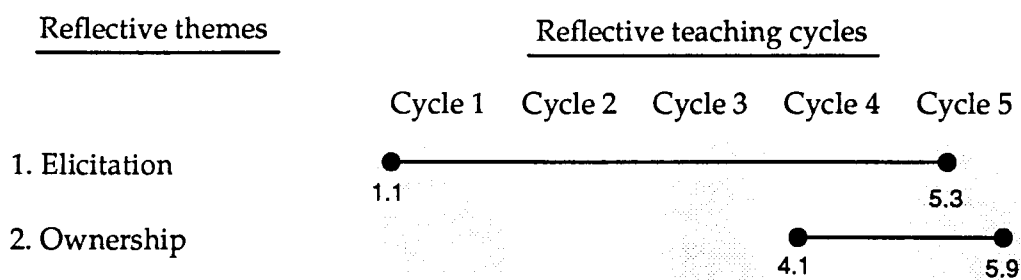
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Reflective themes	Reflective teaching cycles				
	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5

Note: The numbers on the time lines refer to the first and final transcript excerpts used to identify a particular theme. For example '3.7' identifies the seventh tape of the third cycle, and 'III' identifies the third tape of the additional interviews.]

Figure 7. The case of Steve: Reflective theme map

The lesson of the first reflective teaching cycle dealt with solutes and solvents. In the pre-lesson discussion, Steve indicated that he was going to begin the lesson by writing a number of items on the board and asking the pupils about the common properties of each. When asked by Cliff as to how he was going get the pupils to 'think' about the properties, Steve indicated that he was going to set it as a question, and then walk around the class to ensure that all pupils were participating:

Steve: As my introduction, I was just going to put a list on the overhead or on the board and just have them think what all these things have in common: salt water, air, brass, pop, glass, etc.

Cliff: Right. Now, how are you going to get them to think about that?

Steve: OK, what I will ask them to do [pauses]. I will put it on the board as a question and have them answer it, write it down in their books. Walk around. I found with my other classes if I don't walk around they don't do it.

Cliff: How long are you going to give them for it?

Steve: A couple of minutes.

Cliff: To write something down and then when you get responses are you going to put all the responses down or just [pause]? What is going to happen?

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Steve: I will sort of see where it goes, if I get the right answer right away, I might go and on and ask someone else and say 'OK, that is so-and-so's opinion what do you think?' They will probably say the same thing. (S/C C1.1 Pre, p. 2)

Cliff suggested that Steve might consider exploring all the answers that the pupils offered, and not only the 'right' answers:

Cliff: It depends on how you want to go. It could be that you start putting all of the responses down, and then discuss them.
Steve: OK.
Cliff: [For example:] 'What do you think about this?' 'Do you think that this is a good answer?' OK? I don't know. But that's an idea. (S/C C1.1 Pre, p .2)

As Steve watched the above pre-lesson conversation on the video, he indicated that he appreciated Cliff's input and that elicitation was preferable to the more direct approach that Steve had initially intended to use:

Steve: That was sort of an alternative. It was kind of a good suggestion that Cliff made. And a different strategy using the same sort of procedure; using the list from the introduction. Instead of just looking for the right answer, sort of putting them all down and going back and discussing the merits of each one. (S/C C1.2 Pre/S, p. 3)

As Steve gave further thought to Cliff's suggestion, he framed elicitation in terms of its utility for 'encouraging the pupils to participate':

Steve: I think that it is good for the kids, instead of them putting forward an answer and then you saying 'That is wrong' and then going to someone else, accept all the answers and then we will discuss everyone[s' answers]. It sort of encourages them to participate. (S/C C1.2 Pre/S, p. 3)

After the lesson, both Steve and Cliff felt that Steve's use of elicitation in the lesson was successful. As Steve watched the lesson, he began to reframe his original notion of elicitation in more substantive terms. He indicated that it was an alternative to teacher-centred instruction in that it utilized the knowledge that pupils brought to the classroom setting:

Steve: I suppose that it is better doing it this way than saying 'This is a definition of a solution' and giving it to them.

Tony: Why?

Steve: Well, instead of them just copying down notes straight off the board, I think that this gets them thinking a bit more. Using all the examples helps them visualize the concept.

Tony: OK. Was this what you intended to do?

Steve: Yeah, I think that it is more effective to use questioning and answering techniques to get information out of the students, instead of making them write it out, me coming with 20 pages of notes prepared and just fire them on the board. (S/C C1.6 Les/S, p. 4)

A similar incident occurred in the second reflective teaching cycle. The objective of the lesson was to introduce a formula for determining dilution factors. In the pre-lesson discussion, Steve indicated that he was going to use direct instruction to begin the lesson: "I was going to show them how it is used" (S/C C2.1 Pre, p. 1). In the conversation that followed, Cliff wondered aloud if the students might be able to intuit the formula for themselves:

Cliff: I was thinking about it myself because I am getting close to that as well. My lesson will be somewhat similar to yours . . . are you going to try and get that out of them or are you just going to tell them straight away? Do you think that they will be able to come up with that themselves?

Steve: I doubt it. I am not sure how I would go about getting it out of them?

Cliff: No, I think that you are probably right. No, no, I am not sure. It was just something that I thought that I could mention. (S/C C2.1 Pre, p. 1)

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As Steve watched this conversation on the video he noted the usefulness of Cliff's suggestion:

Steve: This was an interesting thing that I really hadn't thought about. Cliff was saying 'Do you think that you could try and get them, using questioning, to probe, and to get them to come up with it.'

Tony: With what?

Steve: The formula for using dilution factors, instead of just saying 'This is how you do it, this is the formula.' You know, initial volume over final volume?

Tony: OK. And is that what he was searching for in that example?

Steve: Mhh, hmm. And I might try it now that he has said that, I might give it a try and sort of see what happens. (S/C C2.2 Pre/S, p. 2)

And later, Steve expanded on his earlier reframing by noting that not only was elicitation an alternative to direct instruction but that it was more effective than direct instruction in helping pupils to 'understand' concepts:

Steve: If it can be done, that is probably the best way to do it because it sort of helps them along the sequential thought process of getting them to the final conclusion; to the final answer that you are looking for. Instead of just coming flat out and saying, this is the case, and then they say 'Why?' I think that if you can develop it, it is probably more effective for the students to understand the concept. (S/C C2.2 Pre/S, p. 3)

As in the first cycle, both Cliff and Steve felt that Steve's use of elicitation was a success. Cliff, who was teaching a Chemistry 11 class in parallel to Steve, suggested that Steve was more successful than he was in eliciting pupil responses for the same lesson:

Cliff: He wasn't even sure that he wanted to do it. He didn't think that he could do it.

Tony: This technique?

Cliff :   Right. He thought that it was too difficult.

Tony: The technique that you suggested to him?

Cliff: Yes. And he has done it better than I did. I didn't do it as well as he did.

Tony: What were the good parts about this particular [technique]?

Clive: He is giving them examples. He is leading them. It is purely inductive and I didn't. I just did one example and I didn't build it up like this with a half, one quarter, one tenth. That was really better. That was a big improvement on what I did. (S/C C2.6 Les/C, p. 5)

Steve's transition from a teacher-centred approach to a student-centred approach was not without its difficulties. Four aspects of this approach were particularly problematic for Steve; three he noted during the first cycle, and the fourth during the second cycle. Each aspect is identified and illustrated with an example:

1) Being able to ask 'pivotal' questions:

Steve: I was really struggling for the right question there. I sort of got off track a bit. I was digging for solute and solvent.

Tony: From the students?

Steve: Yeah. And the questions that I gave didn't get me anywhere . . . The looks that I got from their faces were like 'What?' (S/C C1.6 Les/S, p. 4)

2) Having enough time to elicit pupil responses:

Steve: It only took me *ten* minutes to get to it [laughs] . . . You could cover so much material in an hour, just by reading off your overheads and just having them copy them down.

Tony: And this has taken 10 minutes to get around to a definition of a 'solution'?

Steve: We have talked for ages! (S/C C1.6 Les/S, p. 4)

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3) The pupils' resistance to elicitation strategies:

> Steve: Well, a lot of times that is all that you want to do, is to copy down the notes, you don't want to have to answer the question. You want the teacher to give you the answer. (S/C C1.6 Les/S, p. 4)

4) The unpredictability of the outcome:

> Steve: Especially not knowing what is going to happen or how it is going to come out . . . It is hard, for me anyway, to sort of predict everything that is going to happen. All the different possibilities. (S/C C2.9 Pos/S, p. 1)

Steve's explication of these difficulties further indicated that he was beginning to view elicitation in substantively different ways to the utilitarian view he articulated in the first reflective teaching cycle.

The lesson of the third cycle was a lab and, other than Steve's interaction with the small groups, it did not provide Steve with an opportunity to experiment further with elicitation. The fourth reflective cycle saw a temporary halt to Steve's use of elicitation as he adopted the safety and logic of a more transmissive teaching style for introducing a new unit of work (see the second reflective theme). In the fifth reflective cycle, Steve's returned to the use of elicitation as a dominant classroom practice. The cycle also provided evidence of Steve's continued reframing of elicitation in substantive rather than utilitarian terms. For example, earlier Steve had indicated that a difficulty he had with elicitation was the unpredictability of the pupils' responses. Now, he felt that unpredictability was an important element of this particular approach to classroom teaching:

> Steve: I am not really sure what is going to happen there [in the lesson]. Um. If it doesn't come off that is fine. I am just curious as to what is going on in their heads. We have talked about two different types or organisms. One is sponges that

don't have any nerve tissue. Now hydra have nerves and we are sort of building on that. I just want to see if they have any sort of guesses as to what their ideas might be as to the next step. To just see what happens. (S/C C5.3 Pre/S, p. 1))

Steve's shift from a utilitarian to a substantive consideration of elicitation had a considerable impact upon his practice. Indeed, elicitation became a dominant classroom strategy for Steve. His reflection on elicitation resulted in a cascade effect on other aspects of his practice. The second reflective theme traces one of these effects.

Review of theme one - Elicitation

Typically, the nature of the initial concerns of beginning teachers, are more utilitarian than substantive. For example, the management of classrooms takes precedence over the management of discourse within those classrooms. As a result, suggestions for improving practice are valued initially for their utility and only later appreciated for the contribution they make to pupil learning. This was the case with Steve's use of elicitation. He initially framed elicitation in terms of its utility for encouraging the pupils to work and later reframed it in term of its substantive pedagogic advantages compared with more utilitarian advantages. This shift was precipitated by Steve's curiosity in the ability of the pupils to intuit the chemical formulae; a idea that was suggested by Cliff.

Two factors emerged from this case that appeared to enhance Steve's reflection on elicitation. The first was his use of 'negative cases' to make explicit the 'unknown' or unfamiliar. It was often difficult for Steve to describe situations, or to frame practices, that appeared to be at a formative stage in his own mind. When Steve attempted to describe new or unfamiliar situations, it was easier for him to say 'what it was not like' by drawing on what he already 'knew.' For example, in this theme, Steve was able to describe what he had hoped to achieve through elicitation by first framing it in terms of what he felt he was unable to achieve through direct instruction. Thus, through the use of the negative case, Steve framed and reframed his notion of elicitation.

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A second factor was Cliff's reflection on his own supervisory practices. After reviewing the pre- and post-lesson discussions, Cliff changed his supervisory practices from 'reporting on' to 'inquiring about' Steve's practice. In a critique of his supervisory practices, he noted: "It is just me spouting off; lecturing, right! And really it would be good to get him involved and for me to see if he really does agree with it, and to elicit some responses from him" (S/C C2.8 Pos/C, p. 3). As a result of this reflection, Cliff invited Steve to actively involve himself in, and to set his own agenda for, the discussions that preceded and followed his lessons.

There were two factors that constrained Steve's reflection on his practice, and in particular upon elicitation. The first was Steve's unfamiliarity with the content. The less familiar Steve was with the content the more 'transmissive' his teaching became. As Steve gained confidence with the content he began to consider other aspects of his teaching as it related to pupil learning: "I am really trying to work on diversity in the class instead of just standing there and talking; lecturing . . . I think that is going to take a fair while to get to that stage where I feel comfortable with the material so that I can just start playing with it" (S/C Steve Int II, p. 7). It was clear that Steve's concern for content constrained his reflection on elicitation.

The second factor that appeared to constrain Steve's reflection about elicitation was Cliff's initial conceptualization of his role as sponsor teacher. Cliff's conception was based, in part, upon his own practica experiences. For example, Cliff's faculty advisor did not debrief Cliff at the end of a classroom observation. Rather, the advisor spoke directly to Cliff's sponsor teacher, who, in turn relayed to Cliff the improvements his advisor suggested. At the beginning of the practicum, Cliff anticipated that I, as Steve's faculty advisor, would play a similar role. When this didn't occur, Cliff re-conceptualized his role as sponsor and deliberately sought to be an active inquirer into Steve's practice.

Three other issues related to reflection, but not directly to the research questions, emerged from this theme. The first was the issue of identifying reflective themes. It would be incorrect to assume that because only two themes were identified in this case that Steve was less reflective than the

three other students in this study[21]. Steve, unlike the other participants, tended to 'think before he spoke.' Thus, he would often articulate a plan for future action without verbalising the intermediate steps taken in the process of arriving at that plan. This made it difficult to identify the various frames he may have brought to bear as he reflected on the problems he encountered in the practice setting. Thus, when students 'think aloud' (as was the case for Sally, Tina, and Jona) it is easier to identify reflection in terms of Schön's four components.

A second issue that arose was that reflection, when it did occur, did not immediately alter Steve's practice. There were instances in this theme where both Cliff and Steve reflected upon their practices with no immediate change to their practices (e.g., Steve's reflection on elicitation, and Cliff's reflection on his supervisory practices). Thus, time and continual support are important ingredients for professional development through reflection.

The final issue that emerged from this theme was the combination of specialist/non-specialist supervision that enriched the pre- and post-lesson discussions that occurred between the Cliff and Steve. Cliff's subject specializations were Biology and Chemistry. My own specializations were physical education, mathematics, and computer science. When Cliff examined elements of Steve's practice during the stimulated recall sessions, he often had to 'make explicit' the connections he was making between content and pedagogy that eluded me as a non-specialist supervisor. As a result, Cliff often pursued these connections with Steve during the pre- and post-lesson discussions. The combination of specialist/non-specialist supervision enhanced the dialogue amongst the three of us.

Theme two - Ownership of one's practice

The second theme traces Steve's reflection upon the ownership of his practice. He initially framed his practice in terms of two influences: his sponsor teacher's practice, and his own experiences as a pupil in traditional classroom settings. As a result, Steve identified with, and incorporated into his own practice, elements of his sponsor teacher's practice that resonated

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[21]   There were four themes for Sally, four themes for Tina, and five themes for Jona.

most strongly with his own prior experiences as a pupil. Later in the practicum, Steve began to contrast the similarities and differences among his developing practice with these two influences. The variance between his practice and these influences precipitated a reframing of his own teaching in terms of ownership for his own practice.

In the lesson of the first reflective teaching cycle there were many similarities between Steve's teaching and Cliff's teaching. Steve noted this towards the end of the first cycle:

Steve: There are some parallels, some consistencies, there is not an abrupt change. (S/C C1.8 Pos/S, p. 4)

Similarities between their teaching practices were also evident during the second teaching cycle. In the third teaching cycle there was evidence that Steve was beginning to experiment more with his own ideas. His lesson plan indicated a growing confidence to select and experiment with a range of different activities for use in the classroom. Cliff recognized this shift:

Cliff: I sense now that he is not just accepting everything I say. (S/C C3.6 Les/C, p. 4)

The fourth reflective teaching cycle was a watershed for Steve's increasing ownership of his practice. He was faced with having to define his practice either in terms of the accumulated wisdom of his sponsor teacher, the influences of his past experiences, or the personal knowledge that he had begun to construct for himself about teaching.

The lesson of the fourth reflective teaching cycle was to be an introductory chemistry class on 'Acids and Bases.' Steve's lesson plan was divided into four segments:

A. Demonstration using three colourless liquids.
B. Elicitation of common acids and bases.
C. Listing of the characteristics of acids and bases.

D. Seat work in which the pupils were to construct their own table of acids and bases.

Steve intended to draw upon the pupils' knowledge from the previous unit to introduce the topic. He wanted to begin with a demonstration and, from that, elicit the pupils ideas about acid/base chemistry. The demonstration involved three colourless liquids - an acid, a base, and an indicator:

> Steve: I won't introduce it as 'Today we are going to start Acid and Bases.' . . . which might lead them to saying 'Oh, well one is an acid and one is a base.' . . . I will just sort of say 'I have two solutions here.' (S/C C4.1 Pre, p. 1)

Cliff worried that the demonstration would mislead the pupils into equating colour change with an acid/base reaction and suggested that Steve reverse the order of the first three segments (i.e., to C, B, A). Following the pre-lesson discussion, Steve opted for re-ordering the segments as suggested by Cliff. As Steve spoke about his decision to jettison his original plan, he framed his practice in terms of two influences: (a) his sponsor teacher's practice, and (b) the safety of traditional, and pedagogically sound, classroom practices:

> Steve: The plan now has changed a bit at this point. My introduction, which I though might work, I was trying to use inductive to try and get the answers out of the class, instead of just saying 'This is A, this is B, this is C', I was trying to draw it out of them.
>
> Tony: Mhh, hmm.
>
> Steve: After looking back on it now, with Cliff's input, it looks like it wouldn't really work. Now that I have been thinking about it a little longer it probably wouldn't work as well as I had planned.
>
> Tony: Really?
>
> Steve: Yeah. It is just a different approach. Instead, Cliff seems to think that it is better to say 'Look this is what we are talking about' and go right into it, instead of trying to induce it out of

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them or draw it from them. I can see where he is sort of coming from.

Tony: So, what are you going to do?

Steve: Um, I think that I might do it the changed way, it is probably the safest way to do it, to get the stuff across, instead of trying to draw it from them. (S/C C4.2 Pre/S, p. 1)

Later, Steve commented upon the 'logic' and 'safety' of this alternative approach to his lesson:

Steve: It seems more logical. Probably a little safer too, I think.

Tony: In what regards?

Steve: When you are presenting the information firsthand instead of trying to [pause], like if you are trying to draw it out of them and they are not getting it, you are probably are going to end up having to give it to them anyway.

Tony: This way you do what?

Steve: You give it to them first and then they can think about it, and then you pose them with a problem based upon the knowledge that you have reviewed with them. (S/C C4.2 Pre/S, p. 4)

The notion of giving it to them (i.e., knowledge), letting them think about it, and then setting the pupils a problem is predicated upon a notion that learning is largely a transmissive act; a characteristic of 'traditional' lecture environments[22].

A second incident during the same discussion also demonstrated Steve's readiness to abandon his own ideas. For the seat-work segment, Steve wanted the students to construct a table based upon an example given in the textbook. Cliff worried that Steve was moving beyond what was required in the Grade 11 curriculum and suggested that, rather than making up a new exercise for the pupils, Steve should use the questions at the end of the chapter:

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[22]   See the first reflective theme for a discussion of Steve's thoughts on a lecture approach versus an elicitation approach to teaching.

Steve: I thought about giving them a series of acids to name, to come up with the formula. One way or another, like pure acids and hypo-acids and stuff. There is a table in there.

Cliff: [Cliff checks the questions at the end of the chapter] Oh. This is OK. No. Those are fine. Those review and practices are fine. Number 1 is OK. Right?

Steve: Right.

Cliff: Number 2 is OK. Right? I mean they have got to know that. Right? . . . Number 3, you tell them not to do because we are not going to use those definitions . . . But they can then do 5, 6, 7, and 8. (S/C C4.1 Pre, p. 5)

In the stimulated recall session, Steve indicated that he had previously judged the questions at the end of the chapter to be inappropriate but decided to follow Cliff's advice:

Steve: [The video shows Cliff looking through the text book] He is looking for an activity, some questions to do at the end. I looked and I thought some of them were kind of stupid but I have changed my mind now.

Tony: Why have you changed your mind?

Steve: Well, I think that it is important to give them sort of some seat work to do in the class, in the last 10 or 15 minutes of the class or whatever. Just to give them a break. To give me a break. So, I have decided to give them some questions anyway.

Tony: Out of their text book?

Steve: Mhh, hmm. (S/C C4.2 Pre/S, p. 4)

This second incident is identical to the first incident in that it was counter to Steve's initial intentions and Steve abandoned his own ideas for those of his sponsor teacher. Despite this, at the end of the cycle, Steve noted that he felt his practice was significantly different to that of Cliff's practice:

Steve: I don't see very many parallels between Cliff and myself as far as teaching practices. (S/C C4.9 Pos/S, p. 4)

Although Steve did not explore the implications of this statement during the fourth cycle, his perceived difference between their styles is particularly interesting in the light of an incident in the fifth cycle.

The lesson in the fifth cycle was a Grade 11 Biology; the topic, 'Evolutionary Changes in Animals' (Invertebrate Zoology - C. Platyhelminthes). Steve had divided the lesson into three segments.

A. An elicitation of pupils ideas.
B. An examination of a specific case.
C. A simple lab.

Similar to fourth reflective teaching cycle, Steve was keen to begin the lesson with an elicitation segment: "I came up with this question 'What do you think?' to see what they think" (S/C C5.3 Pre/S, p. 1). By relinquishing direct control of the classroom discourse, Steve realized that the outcome was somewhat unpredictable: "I am not sure what is going to happen there. Um, if it doesn't come off that is fine" (S/C C5.3 Pre/S, p. 1)[23]. Steve's willingness to take this risk, one which he had tentatively planned but decided against in the fourth cycle, was indicative of an increased confidence in his own practice: "I feel sort of more confident now, I have sort of progressed to a point where it is like 'I am going to do this" (S/C C5.3, Pre/S, p. 3).

Following the pre-lesson discussion, Cliff noted that he was deliberately letting Steve teach the lesson as planned, although it was at variance with the way Cliff would have taught it: "I am letting him go with this. Again he is doing it differently" (S/C C5.2 Pre/C, p. 4). The nature of this difference was not discussed, but an aspect of this difference became apparent later in the cycle.

During the course of the fifth cycle, Steve was involved in a field trip and was unable to teach one of his two Biology 11 classes. Cliff offered to

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[23] This was building upon Steve's use of elicitation as a dominant classroom strategy. (See the first reflective theme).

'cover' the second class in Steve's absence. To ensure that the two classes remained 'on par,' Cliff used Steve's lesson plan for the class[24]. Later, as Cliff watched video tape of Steve teaching the first class he suddenly realized that he (i.e., Cliff) had unconsciously rearranged the order of the first two segments:

> Cliff: Oh, now isn't that strange, I just noticed something. They copied down the notes and then he showed them the diagram. And that is a good way to introduce the lab but I did the other way around. I showed them the diagram and then the notes. That is all. That is what I did because I just did it his lesson, right. And I thought I did his lesson. But I didn't. I started off with a diagram first and then did the notes. (S/C C5.5 Les/C, p. 6)

When Cliff asked Steve about the ordering of the segments, Steve replied that the order was unimportant:

> Cliff: I don't know whether it was down on your lesson plan or not, I showed the overhead first, and then did the notes. Did I do it wrong?
>
> Steve: I don't think so.
>
> Cliff: OK.
>
> Steve: I don't think it really matters.
>
> Cliff: Oh. OK. All right. I just thought, the reason that I did it that way was because it was nice for them to see it before they write about it. I didn't do it deliberately, I just did it. And then when I saw the tape, I said 'Whoa, he is getting to show the diagram now, and when I did his lesson I did it before.'
>
> Steve: I don't think that it matters that much. (S/C C5.7 Post, p. 2)

Steve's reaction here is reminiscent of the fourth teaching cycle in which he dismissed the ordering of the segments as being relatively unimportant to

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24 It is common practice for a teacher who is absent on an excursion to leave the lesson plan for the 'substitute' teacher to follow.

his lesson. Later, during Steve's stimulated recall of the above discussion with Cliff, it became apparent that, contrary to Steve's comments on the tape, Steve felt that his original ordering of the segments was important. As he explained this, Steve demonstrated an increasing sense of ownership for his practice:

> Steve: There are points for and against both methods, to show the actual diagram first and then talk about the structures afterward, or try and build it and then show it. I was trying to do general characteristics of the types of organisms in this phylum and then say, 'OK, now that we know what the general body plan of these types of organisms are, lets look at one specifically, the planaria.' Instead of saying 'Here is a planaria, and here's what it's body plan is, blah, blah, blah, this is what happens,' where you might get sort of focussed [on that one animal]. Say 'Well, maybe this in not the only organism in this phylum that has this sort of structure.' I think that was the way that I sort of worked it. Trying to go from general to specific. Instead of specific and staying with it. (S/C C5.9 Pos/S, p. 2)

Steve's reframing of his practice in these terms signaled a growing independence from the practices of (a) his sponsor teacher, and (b) his past experiences with traditional practices, towards an increasing ownership for his own practice. This is consistent with a statement he made earlier in the cycle:

> Steve: I feel sort of more confident now. I have progressed to a point where it is like 'I am going to do this.' (S/C C5.3 Pre/S, p. 4)

Review of theme two - Ownership of one's practice

The practicum is the first opportunity that many students have to teach in a classroom setting. In the absence of a well established teaching style, student-teachers often imitate the practices of their sponsor teachers or draw

upon their past experiences as learners[25] (e.g., the most recent being their undergraduate years at university). The result of these two influences is that student-teachers often identify with, and incorporate into their own practice, elements of their sponsor teachers' practices which resonate most strongly with their own experiences. This was the case for Steve. He framed his early practice in terms of these two influences. As the practicum progresses, most students become more innovative and begin to experiment with a wider range of classroom strategies. Such experimentation often signals the development of a teaching style that is uniquely their own. This trend was also clear during Steve's practicum. He began to contrast the practices of his sponsor teacher with his own practices. The degree of variance between the two precipitated a reframing of Steve's practice in terms of a teaching style that was uniquely his own.

Five factors emerged from this theme that enhanced Steve's reflection on his practice. The first was Cliff's confidence in Steve's ability to teach. This enabled Steve to experiment with a variety of different teaching practices that suited his own personality and style: "[Cliff] showed a lot of confidence in me and that sort of fostered confidence in myself . . . and once you get a little bit of confidence and sort of 'I can do this,' then you just go and do it and you get better and better as it goes on" (S/C Steve Int, p. 1). As a result, Steve went on to experiment with a practice that was uniquely his own.

A second factor which is closely related to the first was the trust that existed between Cliff and Steve. While the first factor was related to Steve's actions in the classroom, the second was related to Steve interactions with Cliff: "He was very supportive . . . I felt that I could go to him" (S/C Steve Int III, p. 5). Steve regarded this as a strength in his practicum and he felt comfortable in raising issues of concern with Cliff. This sense of trust in his dialogue with Cliff enhanced Steve's reflection on his own practice.

A third factor was Steve's use of the video tape to review his teaching. He found the tapes of his lesson to be useful in analysing his practice: "The film sessions have been really valuable as a sort of analytical tool to pick out

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[25]   Lortie (1975) refers to this as 'the apprenticeship of observation.'

the little things that you are not aware of . . . it is a lot easier if you can see it yourself" (S/C C5.9 Pos/S, p. 4). He also noted that seeing himself on tape added a dimension that would be hard to duplicate through paper and pencil reporting: "It is fine for someone to sit at the back of the class and write notes and you meet with them afterwards . . . but for you own sake it is better to see it yourself" (S/C Steve Int III, p. 14). Thus, video provided an additional perspective from which Steve could view his practice.

Another factor that enhanced Steve's reflection on his own practice was his periodic observation of his sponsor teacher's practice. For example, while 'brain-storming' was a common activity in Cliff's classes, it wasn't until week nine that Steve began to 'make-sense' of Cliff's references to 'brain-storming' after sitting in on one of Cliff's classes: "The interesting thing is, that with this technique that Cliff uses, not all the time but quite often, you write everything on the board; if they say the world is flat you put that on the board too" (S/C C4.2 Pre/S, p. 2). As a result, Steve was able to make connections between theory (as articulated by Cliff in their discussion sessions) and practice (as displayed by Cliff in his teaching). Regular observation and dialogue helped Steve make-sense of his sponsor's 'talk' in ways that did not seem possible through 'talk' alone.

The fifth factor that enhanced Steve's reflection on his practice was the network of students that he constantly met and conferred with during the practicum. Steve drew upon his peers both within and beyond the school setting to discuss his practice: "I talked to people in my class, like on the phone at night . . . I will say 'This is what I am doing' or if I have an idea I will say 'I am thinking of doing this, what do you think?'" (S/C C5.3 Pre/S, p. 3). Sharing ideas amongst with other student enriched his own practice and the discussions about that practice, particularly as he began to define a practice that was uniquely his own.

There was one factor that emerged during the course of this theme that appeared to constrain Steve's reflection on his practice: insufficient time to reflect on his practice. Towards the end of the practicum, Steve had very little time to sit down and think about his practice: "Another thing about teaching that I found was just getting ten minutes to yourself to sit back to sort of say

'OK, what am I going to do next?" (S/C Steve Int III, p. 8). The increasing workload exacerbated this: "It's great teaching two out of eight [blocks], you have all the time in the world to prepare your lessons and to have everything ready to go; it's beautiful, but when you are up to a full load" (S/C Steve Int III, p .8). Thus, as the practicum progressed there was less and less time for Steve to reflect on his own practice.

III. Summary

Table 6 provides an overview of the two reflective themes in the case of Steve. The table also provides a summary of the factors which enhanced or constrained reflection, and related issues

Table 6. Summary of results for the Case of Steve

	Research Questions One and Two				Research Question Three	Related Issues
Theme	Precipitated by:	Framed in terms of:	Reframed in terms of:	Plan for future action:	Factors which enhance (E) or constrain (C) reflection:	
Elicitation	Curiosity in ability of the pupils to intuit formulae	It's utility for encouraging pupils to work	It's pedagogical value for pupil learning	To use elicitation to actively engage pupils in their own learning	• The use of negative cases (E) • Cliff's reflection upon his supervisory practices (E) • Steve's unfamiliarity with the content (C) • Cliff's initial view of his role as supervisor (C)	• It is easier to identify individual aspects of reflection when people talk as they think • Reflection does not always immediately alter one's practice • The combination specialist/ non-specialist supervision
Ownership of one's practice	Variance between Steve's and Cliff's practice	Steve's sponsors practice and traditional classroom practices	A teaching style that was uniquely Steve's own	To get the pupil's to try to 'build' their own knowledge	• Cliff's confidence in Steve's ability to teach (E) • Atmosphere of trust between Cliff and Steve (E) • Use of videotape (E) • Steve's periodic observation of Cliff's teaching (E) • A student network (E) • Insufficient time for reflection (C)	

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CHAPTER 8

The Case of Jona

The structure of this chapter is identical to the previous chapters: it begins with a theme map, an explication of the themes then follows, and it concludes with a summary table.

I. Introduction

The fourth case study is based upon the practicum experiences of Jona. Jona came from a city in southern interior of British Columbia where he attended both elementary and secondary schools. He also completed the first two years of a B.Sc. degree in biology at the local community college before transferring to UBC for his final two years. After graduation he entered the teacher education program at UBC. For his practicum, Jona was assigned to the same school as Steve. His sponsor teacher was Gary, a senior mathematics and science teacher with 30 years of teaching experience. Gary had supervised fifteen student-teachers prior to supervising Jona.

II. Analysis

There were five reflective themes identified in this case: direct instruction; levels of understanding one's practice; a link between unit themes and lesson objectives; ownership of one's practice; and rigidity versus flexibility in the use of lesson plans. The duration for each of these themes across the practicum is depicted in Figure 8.

Theme one - Direct instruction

Direct instruction is an approach to teaching that is characterized by teacher-centred instruction and whole-group learning[26]; an example of direct instruction is the lecture method. Some researchers have suggested that students' prior experiences with direct instruction, particularly at the senior high school and undergraduate levels, significantly influences the way they conceptualize teaching and learning[27]. At the beginning of the practicum, it

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[26] For a discussion of direct instruction see Ornstein (1990), p. 302-307.
[27] See Feiman-Nemser (1983) - 'the hand of the past'; and Lortie (1975) - 'the apprenticeship of observation.'

was clear that Jona's prior experiences with direct instruction had a strong influence on his teaching practice.
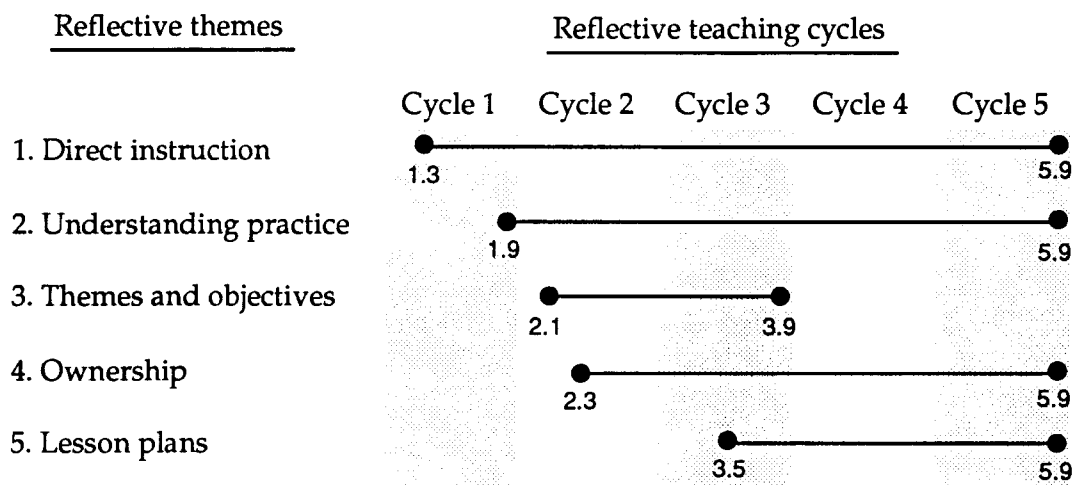
Reflective themes	Reflective teaching cycles

	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5
1. Direct instruction	●1.3				●5.9
2. Understanding practice		●1.9			●5.9
3. Themes and objectives		●2.1	●3.9		
4. Ownership		●2.3			●5.9
5. Lesson plans			●3.5		●5.9

Note: The numbers on the time lines refer to the first and final transcript excerpts used to identify a particular theme. For example '3.7' identifies the seventh tape of the third cycle, and 'III' identifies the third tape of the additional interviews.

Figure 8.   The case of Jona: Reflective theme map

In the lesson of the first teaching cycle, Jona noted that he was going to use a direct instruction approach:

Jona: Basically, stand up the front and talk about this stuff. You know? 'I will write some stuff on the overhead and you guys copy it down and we will get an understanding.' (J/G C1.3, p. 2)

As the lesson progressed, an incident caused Jona to question this approach. Jona called upon a pupil, Michala, to give her answer to one of the homework questions. Michala replied "Magnesium," to which Jona replied "Correct." As the class checked their answers, one girl called out "How did you get that? . . . Like, I am totally lost" (J/G C1.5 Les/J, p. 1). Jona then spent the next ten minutes explaining to the class how Michala got her answer. Jona did not call upon Michala, or any other pupil, during his explanation. At the conclusion of his explanation, further queries from the pupils

indicated that many were still confused. Suddenly, Jona realized that a key piece of information the he assumed had been given in the question was missing. He quickly back-tracked and said that he would accept one of two answers, either "'Magnesium' or 'It can't be done'" (J/G C1.5 Les/J, p. 4). As Jona watched this incident on video, he noted that it would have been better at the beginning to ask Michala to explain her answer rather than attempting to explain it himself:

> Jona: I should have said to Michala, she was the one who said magnesium, 'Michala, how did you get magnesium?' And then let Michala explain it . . . And that would have saved me a big time headache. (J/G C1.6 Les/J, p. 2)

Jona noted that his own extensive elaboration of Michala's answer had backfired:

> Jona: I ended up shooting myself in the foot. (J/G C1.6 Les/J, p. 4)

This incident was one example of Jona's use of direct instruction in the classroom. Another example occurred in the second cycle. Jona taught a lesson in which the first half was a lecture and the second half was a lab. When the lab started, it soon became apparent that the pupils were encountering considerable difficulty with the work. When Jona began to check for the source of the difficulty, he found that the pupils' notes from the lecture segment were very poor. He framed the difficulty that the pupils were having with the lab in terms of the their poor note-taking ability and their unfamiliarity with direct instruction. To overcome these problems, he decided to supplement his verbal presentation with a visual component:

> Jona: You see, again, I am sort of in the university mode 'If I say it, you write it down.' I have got to remember that they are not quite university primed yet. [If I] put it down on the board that will make it easier for them. (J/G C2.7 Post, p. 2)

He hoped that by writing key words and phrases on the board that it would be easier for the pupils' to take notes:

Jona: It is just that, again, I am in that university mentality where 'If the prof says it, it goes down on the paper.' . . . I have got to get out of that and say 'Well, these guys aren't quite university yet, so you are going to have to write more things down.' (J/G C2.8 Post/J, p. 2)

Despite adding a visual component to the lesson of the third cycle, Jona still found that the pupils had difficulty with his direct instruction approach. During the cycle, Gary, Jona's sponsor teacher, also noted that the pupils tended to tune out when Jona was lecturing:

Gary: If you are going to sit up there and talk, they are going to say 'Oh, yeah, yeah,' and pretty soon they are going to be gone. (J/G C3.5 Les/G, p. 4)

In the stimulated recall session that followed the post-lesson discussion, Jona agreed that his instructional style had too much of a lecture orientation and that he needed to find alternative approaches to classroom instruction:

Jona: I am getting too much into 'Write the notes out' and 'Copy it down' . . . I noticed even in teaching my Grade 10 class today it was just copying stuff down . . . Really, it's got more of a lecture flavour than I would like, and I don't like that, but my mentality so far has been 'Well, what else can I do?' (J/G C3.9 Post/J, p. 2)

In the fifth cycle, Jona began to critique his use of direct instruction. He surfaced two underlying assumptions that attracted him to this method: it permitted a high degree of teacher control, and it required less preparation than other methods of instruction. Despite these advantages he felt that he would not use this approach regularly in his future practice:

Jona: Direct instruction is easy.
Tony: Why is it easy?

Jona: Because you are in control. It is like, how can I describe this? Well, you are in control, they have a specific job to do, the students, you know, which is to listen to you, to take notes, to do questions or whatever. You don't have to work too hard to think up novel ideas for the lesson.

Tony: OK.

Jona: I mean you have to but it is not as if you are trying to come up with games or stuff like that.

Tony: Mhh, hmm.

Jona: So, it's actually easier than other forms of instruction.

Tony: OK.

Jona: So, it was good for me to learn how to do that but I don't know if I will stick with it that much. (J/G C5.9 Post/J, p. 3)

As Jona further examined his use of direct instruction, he began to reframe the issue not in terms of the pupils' difficulty with the method but in terms of the method itself. His main criticism was the lack of feedback and interaction it permitted between the members of the class and with the teacher. He noted that direct instruction allowed very little monitoring of pupil learning at the actual time of instruction:

Jona: What ends up happening is that the classes don't always go as well. Maybe the students don't go as well. They don't learn as well . . . If the students don't learn it as well then that is not as apparent right away . . . It is unfortunate because a lot of times it doesn't work out and you don't see it right away. And the students are the ones that end up suffering. (J/G C5.9 Post/J, p. 4)

By comparison, Jona noted that alternative instructional methods allowed for more feedback and interaction:

Jona: If you have got them doing group work or games or whatever you see a lot more. I mean, you can't get feedback unless they are talking or doing something, and if you are doing direct

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instruction, generally they are not talking too much. (J/G C5.9 Post/J, p. 4)

Thus, Jona's reflection on direct instruction resulted in new approaches and ideas for his teaching. While he still planned to use direct instruction, he wanted to incorporate alternative approaches that permitted interaction between the teacher and the pupils.

Review of theme one - Direct instruction

Jona experimented with several different instructional methods during his practicum; one of these was direct instruction. He found that the pupils performed poorly when he used this form of instruction. He initially framed this problem in terms of the pupils' unfamiliarity with the method. He felt that once the pupils were better at taking notes their performance would improve. After incorporating strategies to improve note-taking, Jona found that only marginal gains had been made in pupils' performance. Jona then made the method (i.e., direct instruction) problematic, arguing that it afforded little interaction or feedback between teacher and pupil, and that this was detrimental to the pupils' learning. Framed this way, it was the method that was found wanting, not the pupils. As a result, he introduced alternative instructional methods which he used in combination with direct instruction that increased teacher/pupil interaction.

Two factors emerged from this theme that enhanced Jona's reflection on direct instruction. The first was Jona's use of 'Student-teacher Evaluation Questionnaires' that he distributed to the pupils. Jona distributed two different questionnaires to the pupils to obtain feedback on his teaching. The questionnaires provided Jona with an additional perspective for reflecting on his practice. For example, after reading the responses to the first set of questionnaires, Jona critiqued his teacher-centred orientation: "This is one part that I have learned throughout this term, especially it hit me after I read those first set of evaluations: "I would normally be talking all through this and racing ahead on the overhead . . . I think back to the lessons I have done . . . you know, I am constantly talking in those lessons" (J/G C5.6 Les/J, p. 4).

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A second factor that enhanced Jona's reflection was the use of video tapes. These video tapes provided an opportunity for both student and sponsor to closely analyze various aspects of Jona's practice. For Gary, the video tapes allowed him to slow down the action and examine Jona's practice in greater detail than was possible *in situ*: "This is a good way to analyze it because you can see things and you can stop it . . . and you can zero in on things that you wouldn't normally be looking at" (J/G C1.5 Les/G, p. 4). In a similar fashion, Jona also found the tapes useful: "I was able to go over again my ideas for the lesson . . . it helped me to evaluate why I am doing this; why it is good to make this change (J/G Jona Int III, p. 4).

One issue that emerged from this theme that was related to Jona's reflection on his practice, but not directly the three research questions, was that reflection, when it did occur, did not immediately alter his practice. Although Jona reflected on his use of direct instruction there was no immediate change in his practice. Time and continual support (e.g., frequent observation and dialogue about his practice) appeared to be important ingredients for professional development through reflection.

Theme two - Different levels of understanding one's practice

After the first couple of weeks on practicum, Jona noted that his interaction with Gary was similar to a teacher/pupil relationship: "To a large extent it is teacher/pupil, it could hardly be any other way" (J/G C1.3 Pre/J, p. 3). Towards the end of the first reflective teaching cycle, Jona noted that he listening more than talking during their discussions and thought that this was appropriate:

> Jona: I mentioned before teacher/student and I think this [discussion] was even more so teacher/student. There is less interaction . . . I think that I did a lot of listening, and that is the point here; I have got to learn. (J/G C1.9 Post/J, p. 4)

By the third teaching cycle, Jona had begun to detect a change in his relationship with Gary; he now regarded the interaction as including both talking and listening:

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Jona: It was mostly one-sided before and it is becoming less one-sided now. I am getting more of a feel for what I need to do in preparation for my lessons and I am also getting more of a feel for what I am doing right and wrong in my lessons . . . Gary was doing more teaching before. He was saying 'Well, OK, you are going to need this, you are going to need to do this, etc.' Now, it has become a little more 'You are pretty right but this is maybe a suggestion.' . . . I guess if I had to describe it briefly I think that I would say that I'm learning from talking to him about this stuff. (J/G C3.3 Pre/J, p. 3)

By the fifth reflective teaching cycle, Jona perceived that the relationship between himself and Gary had developed to the point where there was a balance between the contributions that each made to the discussions. Indeed, Gary encouraged Jona to put forward his own ideas. At the end of the fifth cycle, Jona framed his interaction with Gary in terms of them both moving to higher levels of understanding his teaching practice:

Jona: We might have talked about this at the beginning of the practicum [but] the thing is now it is on a different level . . . It is on a different level between the two of us. Now it is more of a discussion rather than 'What do I do in this situation?' (J/G C5.9, Post/J, p. 4)

As Jona gave more thought to this shift, he began to explore the circumstances that enhanced it:

Jona: First of all, because Gary and I have progressed to a point in our relationship where we are comfortable with each other discussing things like this.
Tony: OK.
Jona: Why we have gone to this different level, perhaps, is because I have learned a lot more about my own behaviour in the classroom. You know? How I deal with the things in the classroom or how I should be dealing with things in the classroom. (J/G C5.9 Post/J, p.5)

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Jona noted that concurrent with this shift was the development of his own unique style of teaching:

Jona: At the beginning of the practicum it was like 'Well, follow a standard approach that we hope works for you.' Now it has got to be my way of dealing with it because it is my personality and I have got to be consistent with my personality.

Tony: And you are not Gary?

Jona: Yeah. I am not somebody who is going to follow Gary's rules because I don't know any better. Now I am a little more comfortable with my behaviour, attitudes, mannerisms, or whatever in the classroom. I can sort of develop my own methods of dealing with things is probably the best way to put it. (J/G C5.9 Post/J, p. 5)

Jona then illustrated the importance of having his own teaching style by referring to a potential disciplinary problem in one of his classes:

Jona: This is something that just occurred to me now. Two months ago if I was aware of this [kid] in the back of the classroom I probably would have leaned on him, this kid. Because that is the UBC method. UBC teaches you that the kid has got to be on-task. You know? And it looks bad if the kid is not on-task. You know, 'My faculty advisor is not going to be to happy if my kids are not on-task.' Now, I am looking at this from my point of view, saying 'Well what is the problem here?' . . . Now I have progressed to a point where UBC has got their little formula but now I have got my own, or I am beginning to develop my own. (J/G C5.9 Post/J, p. 6)

As Jona explored the notion of different levels of understanding his practice, he began to reframe the issue not in terms of a parallel movement by both Gary and himself to higher levels but in terms of him moving to a level of understanding commensurate with that of Gary:

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Jona: I have been thinking about this now, this different level that we are at. I don't know so much as if we are really on a different level but perhaps I am understanding at a different level. Like we could have exactly the same discussion in January, and I would have understood it on a certain level. Perhaps a surface level. But now that I know the kids, I know the teachers, I know the situation, I understand this whole discussion a lot better. I understand it on a different level. You know?

Tony: Yes.

Jona: Like I have been trying to pin it down. I can see myself having this same discussion back in January but there is something different. I think I am really understanding what it means. Before it would have been superficial . . . In January, we could have had a very broad discussion. It is a little deeper now. This discussion is somewhat different, but also I am understanding it at a different level. (S/C C5.9 Post/J, p. 8)

Jona then drew upon the notion of a funnel to depict his different levels of understanding practice:

Jona: It was sort of 'the lesson' but broader; from a broader perspective. Before what we used to do was sit there and look at this part of the lesson and take it apart and dissect it. What we are doing now is taking this part of the lesson and expanding upon it. You sort of look at it like a funnel. You get the part of the lesson, like before we were taking it apart and saying 'This is what I did wrong,' etc., or 'This is what I did right,' or whatever. Now we are looking at it and saying 'Yeah, you did this right,' and now we are expanding on it saying this is the kind of stuff you have to do. . . . Going from the microscopic sections that we were doing before, and now taking a section and looking at the bigger picture; the implications of everything and how it fits into teaching in general, school, life, etc. (J/G C5.9 Post/J, p. 9)

Jona's sense of the practicum "funnel" is depicted in Figure 9. With the passage of time, Jona's understanding of his practice moved from a technical perspective to a more conceptual perspective; something akin to moving a view finder forward and backward resulting in a variety of possible frames.
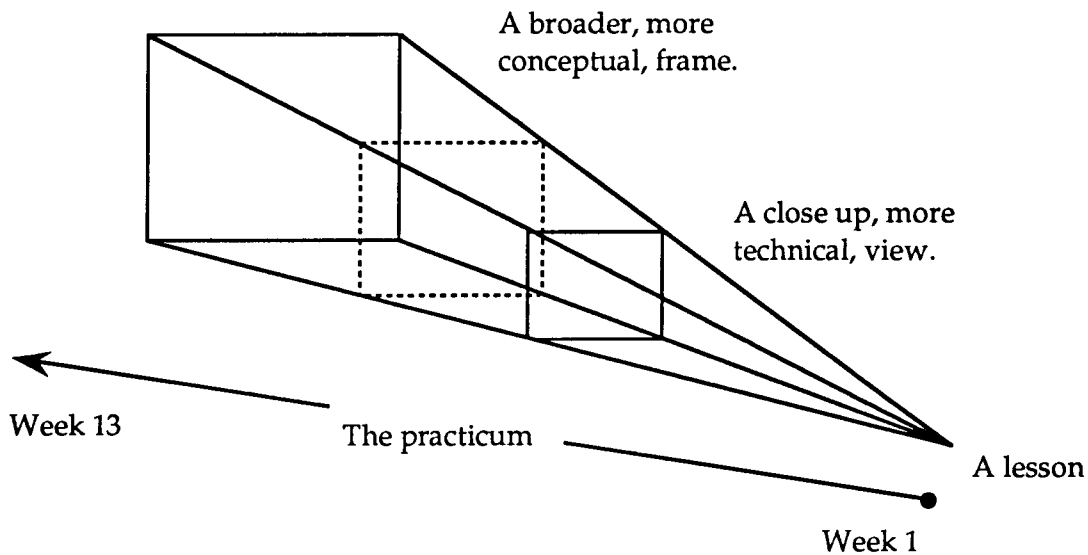
Figure 9. Jona's practicum "funnel"

Thus, Jona's reflection on the different levels of understanding provided him with both a fine-grained, detailed perspective as well as a broader, more conceptual frame.

Review of theme two - Level's of understanding one's practice

Typically, at the beginning of a practicum, student-teachers imitate the practices of their sponsor teachers; the interaction between the two is often regarded by the students as a teacher/pupil relationship. As the practicum progresses and the students take greater responsibility for their own teaching. They begin to develop teaching styles that are uniquely their own. At this point, the students often characterize their interaction with their sponsors in terms of a teacher/teacher relationship. This was the case with Jona. This shift precipitated Jona's reflection on the sense he was making of the practicum in comparison with that of his sponsor teacher. He initially framed this in terms of a parallel movement by both of them to progressively

higher levels of understanding. Later he reframed this in terms of himself moving to a level of understanding commensurate with that of Gary.

Two factors emerged from this theme that enhanced Jona's reflection on his practice. The first was Jona's interaction with Gary beyond the classroom setting. Jona involved himself in a number of extra-curricula activities with Gary (e.g., soccer coaching, helping with the school dance, excursions to the aquarium, etc.). The two became good friends. This was evident in their pre- and post-lesson discussions which, over the course of the practicum, became increasingly conversational as opposed to instructional. For example, at the beginning of a session they would often briefly recap the extra-curricula events of previous day. This easy manner would then continue into their discussions of Jona's teaching practice providing a non-threatening atmosphere in which Jona could examine and critique his practice.

The second factor, closely linked to the first, was Jona's active participation in the pre- and post-lesson discussions. As the rapport between Jona and Gary developed, Jona actively involved himself in, and set the agenda for his discussion with Gary: "It was mostly one-sided before and it is becoming less one-sided now" (J/G C3.3 Pre/J, p. 3). Thus, Jona's active participation in his dialogue with Gary enhanced his reflection on his practice.

Theme three - Unit themes and lesson objectives.
Early in the practicum Jona taught a unit of work based upon animal physiology and evolutionary development.' One of the lessons within this theme was entitled 'The Planaria and the Earthworm.' This lesson took place during the second reflective teaching cycle. There were three distinct segments during the lesson: an instructional segment, a lab explanation segment, and a lab. During the pre-lesson discussion, it became apparent that the link between the overall unit theme and the individual lesson objectives was absent in Jona's lesson plan:

Gary: Now, overall, what do you hope to accomplish?
Jona: OK, the outcomes that I see are that the pupils should be able to name the parts of the planaria: the outsides parts, the surface

parts. Be able to describe its reaction to certain stimuli: light, water current, acetic acid, table salt, and their reaction to touch from a probe. Also, from the earthworm, note the parts on the outside and the inside; the parts that are big enough to recognize. (J/G C2.1 Pre, p. 2)

Gary then hinted that the pupils should be able to go beyond just describing the animals and be able to draw conclusions about the physiological differences between all the animals under study (i.e., the overall unit theme):

Gary: But, what about comparison? You have got two different kinds of worms?

Jona: OK.

Gary: Now, [the pupils] should be able to see the difference between a flat worm and a round worm and why one is more advanced that the other: 'What does the earth worm have over the flat worm?'

Jona: OK.

Gary: They should be able to see that you have gone from an organism that has one entry for food and exit for waste to two; one for food and one for waste. That is a tremendous development, even though they all belong to worms.

Jona: Right, I will mention that. (J/G C2.1 Pre, p. 2)

As Jona watched this conversation on tape, he noted that he had forgotten to link the lesson objectives to the unit theme:

Jona: Now, this again snapped me back to what I was doing. The underlying theme in all of this is the evolution of animals. And you are going up the evolutionary tree to more and more complex animals. And I mentioned it when we talked about worms last day during class but the tendency that I find in labs is to just say 'Well, OK, go to it!' (J/G C2.3 Pre/J, p. 3)

Despite this reminder, in the actual lesson, the link between the lesson objectives and the unit theme received scant attention. Indeed, the only

mention that Jona made of the relationship was a brief statement at the end of the first segment:

> Jona: Keep in mind that they are higher on the evolutionary tree. Why are earthworms higher on the evolutionary tree than planaria? (J/G C2.5 Les/G, p. 2).

Later, as Jona watched this segment on video tape, he noted that he was unsure about how he would relate the individual lesson objectives to the overall unit theme:

> Jona: This was what Gary had told me about, to compare the two worms. He mentioned that maybe I could get them to write something out . . . I thought about that. I thought that [the lesson is] long, though. There is lots to do. If I mention it to them, at least it is in their minds. Hopefully they are thinking about it. I didn't know if I should go through it and have them actually write something out? (J/G C2.6 Les/J, p. 2)

In the lessons that followed, maintaining a link between the objectives and themes was a recurring problem. It was manifest in the difficulty that the pupils had in making connections within and across the lessons of the various units. Jona framed the pupils' problem in terms of external factors over which he had little or no control, for example: the time of day, the pupils' passive approach to learning, the pupils' lack of enthusiasm, and the pupils' reluctance to answer questions. He also felt that it may have been the nature of the subject itself:

> Jona: We do a couple of questions and look at things, but you know, with these things it is like 'This is the class [phylum].' 'These are the characteristics.' 'This is this.' 'And this is this.' Maybe the subject material contributes to it a little bit? (J/G C3.6 Les/J, p. 3)

Jona was intrigued by an incident that occurred during the lesson. He watched the incident once and then rewound the tape to look at it a second

time. It was a section of tape in which Jona had been reviewing with the students the homework questions assigned the previous day. The pupils were having considerable trouble in answering one of the question. After several attempts by the class to provide the correct answer, a pupil named Maria[28] finally called out:

> Maria: [Said in frustration] What are you looking for? (J/G C3.6 Les/J, p. 10)

When Jona saw this on tape, he stopped the tape and began to question his ability to clearly communicate what he was looking for in a homework question:

> Jona: OK. You see. That is it right there. When she said that, I said, 'Oh, god.' I really knew that I had a problem . . . That one rang in my ears for the rest of the class and that is the one that kept coming back to my mind: 'What are you looking for?' Well, if I haven't made it clear what I am looking for then what am I doing up here asking these stupid questions? If I haven't made it clear then they are little more than stupid questions!
>
> Tony: I guess so?
>
> Jona: And it is a waste of time. (J/G C3.6 Les/J, p. 10)

As Jona advanced the video tape a little further, Maria was seen expressing her frustration even more eloquently; frustration that was evident among the other members of the class:

> Maria: It's hard to think when you don't know where you are thinking to. (J/G C3.6 Les/J, p. 11)

From her comment, it was clear that the links between the lesson objectives and unit theme were neither obvious nor readily apparent.

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[28] One of the most academically able pupils in the class.

Jona and Gary talked about this incident during the post-lesson discussion and agreed that something needed to be done. As Jona reviewed this conversation, he began to reframe the problem not in terms of external factors over which he had little control but in terms of the need for 'an angle' to connect the elements of a unit together. He likened the pupils' quandary to that of reading a paper that had no thesis, or to participating in a conversation that had no point:

Jona: Actually, now that I think of it, this is what I was missing . . . Whenever I write a paper [pause], you know how you write a paper and you have a thesis, . . . that's my angle. And I am going to write in that vein. When I come into a classroom I have got to have an angle, something that I am trying to get at . . . This is all coming to me now. I was in [the classroom] and I was talking but there was no point to what I was saying. I was just talking! You know? It was almost like 'casual.' When you think about a casual conversation with somebody, there is no real point to it a lot of times.

Tony: Right.

Jona: Nothing! Like 'How's the weather?' 'Oh, the weather is fine.' And that is the sense of it that I am getting. There is no point to it. I am almost filling in time because they have to be there, so, we will just talk about this stuff in the text.

Tony: OK. So, is there no point for you or for the students?

Jona: Well, for both I think. I don't have a point that I am getting at so they are not getting anything really. (J/G C3.9 Post/J, p. 7)

Having reframed the problem in terms of needing a point or a thesis, Jona then suggested how he might do this in future classes:

Jona: But I have got to have more of a point. Like, 'This is what we are looking at today. We are looking at arthropods, and notice the diversity in body plan; notice the differences in habitats. This is a very diverse group.

Tony: And have that running throughout the period and having it anchoring off that?

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Jona: Yeah. Actually I could clear some garbage off the blackboards and I can write down 'These are the three key points that we are going to keep coming back to.' (J/G C3.9 Post/J, p. 8)

Indeed, throughout the remainder of the practicum, Jona attempted to emphasize the links between the individual lesson objectives and the unit themes. His reframing of the problem, from external factors over which he had no control to internal factors over which he had considerable control, enabled him to devise strategies to ensure that the pupils were more successful at recognizing the relationships between the objectives and unit themes.

Review of theme three - The link between themes and objectives

Jona found that during the first half of the practicum his pupils had difficulty in making connections within and across the lessons of a particular unit. As he sought to understand the pupils' difficulty in this regard, he framed the problem in terms of external factors over which he had little or no control. An incident during the third reflective teaching cycle caused Jona to reframe this issue in terms of his failure to maintain a strong link between the lesson objectives and unit themes. Jona likened this failure to writing a paper without a thesis or conducting a conversation without a point. Thereafter, he deliberately maintained common threads throughout the unit to ensure that individual lesson objectives remained closely linked to the unit themes.

Three factors arose from this theme that enhanced Jona's reflection on his practice. The first was the use of stimulated recall sessions of pre- and post-lesson discussions. These sessions provided Jona with an opportunity to put into his own words what he understood his sponsor to be saying. For example, during one discussion Gary suggested that Jona needed a gimmick to tie his lessons together. As the discussion continued, Jona reframed Gary's notion of a gimmick in terms of the need for an angle. Only later, in the stimulated recall session, did he realize that he had re-cast Gary's suggestion: "There is probably a difference between what we mean by a gimmick and an angle" (J/G C3.9 Post/J, p. 10). At that point, he began to explore and to make sense of the two terms in relation to his own practice. Thus, stimulated recall

provided the opportunity for sense-making that became part of Jona's framing and reframing of his practice.

A second factor that enhanced Jona's reflection was his encouragement of pupils to be critical and independent thinkers. This coincided with a feature of the curriculum at Jona's school: a 6 month off-campus challenge program available to Grade 10 students. This program is designed to encourage pupils to be independent and critical thinkers. When the practicum began, Jona was given two Grade 10 classes that had just returned from this program. It was clear that these pupils were inquisitive and thoughtful about their work. They wanted to be active participants in their own learning[29] (e.g., the Maria incident). Jona's interaction with the pupils caused him to think carefully about his practice.

A third factor that enhanced Jona's reflection was teaching multiple sections of the same course. Jona noted that teaching the same material to more than one class allowed him to "package it better" (J/G C2.6 Les/J, p. 4) in later classes. Also, teaching multiple sections of a course shifted the emphasis during pre- and post-lesson discussions, from content (What is to be taught?) to more substantive issues (Why and how it might be taught?).

One factor that appeared to constrain Jona's reflection was brief, unfocussed, or unrecorded, observations by his supervisors (in this case, the sponsor teacher and faculty advisor). When classroom observations became a casual activity, Gary and I tended to recall only the most visible and readily identifiable aspects of teaching; typically these were issues of a technical nature. Technical issues usually required less analysis, and were easier to speak about than substantive issues. Casual observation neither allowed us to appreciate, nor raise with Jona, the subtleties that were inherent in his own practice. Gary and I recognized this and altered our supervisory practices accordingly. As a result, later discussions began to encompass a broader range of issues.

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29   Indeed, when I first observed these classes, I was convinced that they must have been
       Grade 11 or 12 pupils.

Theme four - Ownership of one's practice

Throughout the first and second cycles, Jona was a keen observer of Gary's practice. He regularly questioned Gary about the strategies and approaches that he used in the classroom. Early in the second reflective teaching cycle Jona sensed that he might have been asking too many questions:

Jona: Sometimes I think maybe I go to him a bit too much. Things are going quite well so far in the practicum. And he has helped me a lot. A lot of times I go to him and ask 'What is the best way to do this,' and I think that he would prefer that I do a little bit more [myself]. You know, if I blow it, I blow it; I learn something.

Tony: And what are the indicators that he is wanting you to 'go it alone' a bit more?

Jona: Well, I will say something like 'What do you think about this, and he will say 'Sounds OK, try it out,' stuff like that. 'See how it goes.' 'Give it a shot.' (J/G C2.3 Pre/J, p. 1)

An incident in the lesson of the second teaching cycle caused Jona to think further about this issue. Mid-way through the lesson, some pupils asked Jona a procedural question about the work. After giving the pupils an answer, Jona checked the answer with Gary (who was seated to one side of the classroom). As Jona watched this incident on video tape he framed his questioning of Gary in terms of not wanting to 'rock the boat':

Jona: You see, I could have given them an answer for what I wanted them to do, right? I had thought about it. 'This is what you do' and 'That is it.' The thing is, I am looking at three classes that belong to Gary, and I don't want to change [his] procedure because to me it is really silly to change the procedure for seven weeks and after I am gone they have to learn Gary's procedure again. So, I really don't want to end up rocking the boat. And this is also why I think Gary is tired of listening to me asking questions 'Well, what about this?' and 'What about this?' But again I am really trying to be careful about rocking the boat

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because I don't want to do that to him or his students. (J/G C2.6 Les/J, p. 6)

In the third reflective teaching cycle, Gary commented on the nature of his interaction with Jona. He felt that it was time for Jona to become more independent:

Gary: I am trying to draw [him out] now. I have almost been leading him by the hand up until now. Now, I am waiting for him to come forth. I want him to design things. I have given him the area that I want covered but how he covers it, I think he is now going to have to make those decisions . . . He has got to swim or sink on his own . . . There seemed to be, up until now, a slight lack of confidence. He was sort of coming to me 'Is this OK?' And now 'Well, wait a minute, the decision has to be yours now, because in six months you are going to be on your own and you are going to have to make that decision.' Whether it is a right or wrong decision, I would sooner see him go through a bad lesson. But the decision is his. (J/G C3.2 Pre/G, p. 3)

In the third reflective teaching cycle, Jona noticed that Gary was more reluctant to provide him with answers to his questions:

Jona: Generally, he didn't really have as much to say as he did in the first two cycles. (J/G C3.3 Pre/J, p. 1)

An incident similar to that described in the second cycle also occurred in the third cycle. In mid-lesson , Jona asked Gary a question about the work the pupils were doing. In the post-lesson discussion, Jona reframed his tendency to continually seek Gary's advice not in terms of 'not wanting to rock the boat' but in terms wanting to teach 'the right way':

Jona: When I asked you about that lab yesterday [in class], how to mark this particular part, I got that impression [that you were saying] 'OK they are yours, you are the boss.' . . . I have a

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tendency to ask too many questions [because] I want to do it right, *I don't want to do it my way, I want to do it right!* (J/G C3.7 Post, p. 4, emphasis in original)

In the stimulated recall discussion that followed, he began to make explicit what he meant by the teaching the right way:

Jona: My problem is I don't want *my* answers, I want the *right answers*. I don't want to do things my way. I want to do things his way . . . You see I want him to tell me the way to do it. Then I will do it, because I know he has developed it over the years; his way is going to be pretty right. (J/G C3.9 Post/J, p. 6, emphasis in original)

But for Gary, it was time to "cut the apron strings":

Gary: He is talking to me, he keeps asking, and going and going and going. He wants to be sure that it is 100% right. Well, you can't be . . . You have got to cut the apron strings. The umbilical cord had gone now. He has got the ability. (J/G C3.8 Post/G, p. 3)

Jona's reframing was pivotal in terms of developing a practice that was distinctly his own. In the weeks that followed, he demonstrated greater independence from Gary and experimented with a number of his own ideas in the classroom. In conversations with Gary, Jona drew upon the notion of a plateau to describing his shift from dependence to independence:

Gary: We were talking about this prior to coming out the door, the fact that he said 'I reached a plateau there for a while.' I said, 'Yeah, we all do, that's learning.' He said 'I was frustrated, I didn't seem to be progressing.' And I said 'Yeah, you did and you went through that.' But I said 'At that time, up until that point, I was allowing you to ask me questions and I was helping you develop it.' (J/G C4.2 Pre/G, p. 1)

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Figure 10 depicts the plateau that Jona reported during his practicum.

Relative change
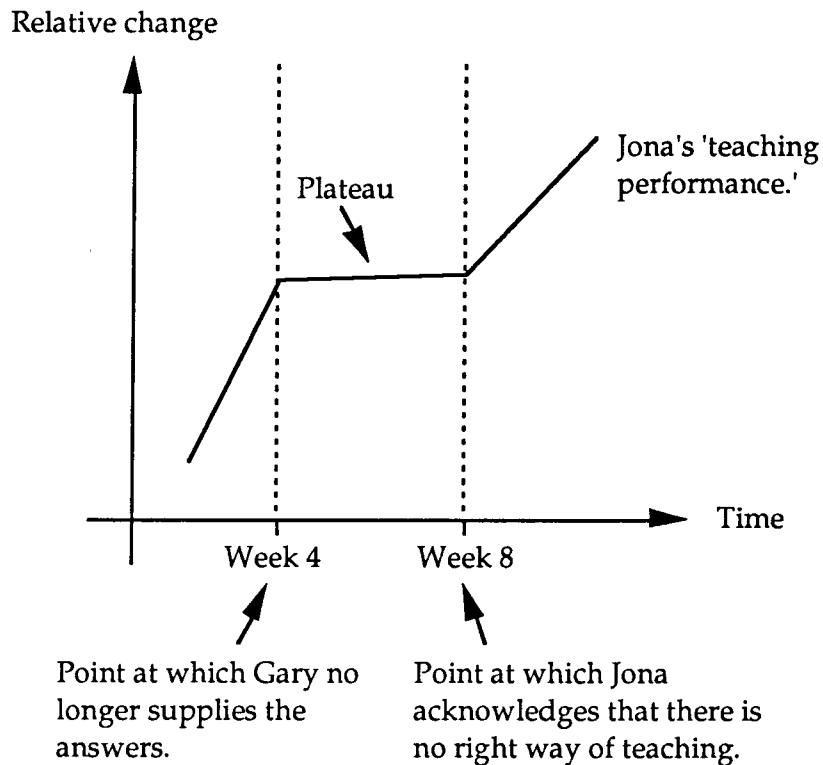
Figure 10. Jona's teaching "plateau"

At the end of the fifth cycle, Jona summarized his reframing of the problem by noting that that there was no right way of teaching, be it Gary's way, UBC's way, or anyone else's:

Jona: And that is something that I have learned from being in the practicum. There is no UBC method, there is no *this* [is the right method], forget it, you know. Well, not forget it, but really there is no tried and true method. You have to learn it yourself. Consider your own situation . . . I guess that is another area of progress. I have become my own teacher rather than a UBC clone. (J/G C5.9 Post/J, p. 7, emphasis in original)

<u>Review of theme four - Ownership of one's practice</u>

At the beginning of a practicum, student-teachers often regard their sponsor teachers as master teachers and themselves as apprentices. Such was the case with Jona in the early weeks of his practicum. Jona regularly sought Gary out for advice and tried to emulate his teaching. He tried to duplicate the routines and procedures that Gary used in his classes. Jona framed his emulation of Gary's practice in terms of not wanting to rock the boat. As the practicum progressed, Gary encouraged Jona to find his own solutions to the various problems he encountered in the practice setting. At this point, Jona's teaching performance began to plateau. It wasn't until after the third reflective teaching cycle that his performance began to improve again. As Jona reflected on the plateau in his teaching performance, he reframed his emulation of Gary's practice in terms of wanting to teach the right way. He noted that earlier, instead of developing his own practice, he had faithfully duplicated Gary's practice. Jona's reflection was precipitated by his concern that he was going to Gary too often for advice and help. Having acknowledged his dependence upon Gary, Jona decided to take greater ownership for his own teaching and to define a practice that was uniquely his own.

Two factors emerged from this theme that enhanced Jona's reflection. The first, Gary's support for Jona as he began to take greater control over his own practice. Gary encouraged Jona to experiment with his own ideas. As Jona took the first tentative steps in this direction, he began to reflect on the ownership of his own practice. Gary's support and encouragement at this time was critical in this regard.

The second factor was Jona's realization that 'the UBC method' was a guide, not a prescription for practice: "Really, to a large extent we were a bunch of UBC clones when we came out on practicum . . . and I mean to a large extent you need that to get started . . . but now I have progressed to a point where UBC has got their little formula but now I have got my own, or I am beginning to develop my own" (J/G C5.9 Post/J, p. 7). As Jona experimented with his own formula, his energies were directed into developing and reflecting on a practice that was uniquely his own.

Three factors were identified that constrained Jona's reflection on his practice. One factor was Jona's unquestioning acceptance of established routines. Jona attempted to faithfully duplicate the practices of his sponsor teacher and did not question Gary's practices. Indeed, he accepted them as givens in the setting. It was only when he was encouraged to experiment with his own ideas that he began to question these practices and to critique each in relation to his evolving practice. Jona's reliance upon established routines inhibited his reflection on his own practice.

Another factor that constrained Jona's reflection was an emphasis on utilitarian rather than substantive issues. During early part of the practicum, Jona's inquiries into his practice reflected a problem solving or a 'what works' approach to teaching[30]. Absent from these inquiries were questions that addressed the appropriateness or value of different activities. Only towards the end of the practicum, and in particular when he acknowledged that there was no right way of teaching, did Jona begin to attend to the particulars of the setting and the importance of these in relation to his own teaching style. Until this occurred, Jona's reflections were constrained by a utilitarian emphasis in his teaching.

The third factor that constrained Jona's reflection on practice was his initial conception of the practicum as a hoop jumping exercise. Jona noted that when student-teachers perceived the practicum as a hoop jumping exercise then learning becomes an activity you do for someone else and not for yourself: "It is like jumping through the hoops, tell them anything that they want to hear" (J/G Jona Int III, p. 1). Because of this perception, Jona initially expected others to set the the agenda for the discussions about his practice. Consequently, he wanted to please his sponsor teacher rather than reflect on and develop his own practices.

Finally, there was one issue that was related to Jona's reflection upon his practice but not directly related to the three research questions that emerged from the analysis. Gary noted that during his 30 years as a teacher he had

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30   LaBoskey (1990) refers to beginning teachers who ask 'what works' questions as 'common sense thinkers' and those who ask 'why' questions as 'alert novices.'

been asked to participate in many different projects (e.g., international educators had used his classroom to examine North American science classes, local Ministry of Education officials had used his classroom as a set for TV and film projects, and teacher educators had used his classroom for their student-teachers). While all these projects were related to Gary's practice, none deliberately sought to elicit Gary's own ideas on teaching and learning. Rather, there was greater interest in the setting in which he taught. By contrast, he felt the current research project with Jona valued both the propositional and experiential knowledge that he brought to the practice setting (informed by 30 years of teaching experience). He enjoyed the opportunity of making explicit the things that intrigued him about his own practice and Jona's practice during the video recall sessions. Attending to and sharing this knowledge both enhanced and enriched the practicum experience for both Jona and myself.

Theme five - Rigidity vs. flexibility in the use of lesson plans

The lesson of the third reflective teaching cycle dealt with molluscs. Jona had divided the lesson into three segments: a introductory film (15 minutes), a teacher-led discussion (20 minutes), and a teacher-centred instructional component (15 minutes). The film was a success in that it generated considerable interest amongst the pupils. Unfortunately, the pupils' initial enthusiasm waned during the second segment, and by the third segment it was almost nonexistent. In short, the lesson died in the the last two segments. The pupils were neither disruptive nor disrespectful, but one by one they disengaged themselves from the lesson. Gary noted that they were not actively involved in the class:

> Gary: They are going through the motions but they are not listening. (J/G C3.5 Les/G, p. 4);

Jona described the pupils' lack of involvement in a similar way:

> Jona: They are on-task but they are dead on-task! (J/G C3.6 Les/J, p. 7).

Despite the fact that Jona sensed the lesson was dying, he steadfastly adhered to the text of his lesson plan throughout the lesson. In the post-lesson discussion, he framed the problem of pupil disengagement in terms of poor lesson planning on his part:

Jona: I guess my organization was just lacking here . . . I thought I was prepared but I wasn't ready for everything . . . we had the count down, we just didn't get the lift off. (J/G C3.9 Post/J, p. 2).

Although the lesson of the fourth cycle was more successful, other lessons around this time continued to display symptoms similar to those described above.

The lesson of the fifth reflective cycle was on the invertebrate body plan. Jona divided this lesson into three segments: a student-centred elicitation segment (15 minutes), a note-taking segment (15 minutes), and a teacher-led discussion (20 minutes). As Jona watched the video tape of this lesson, he contrasted his current practice with that of the third cycle. He noted that he had become less dependent upon his lesson plan *per se* and was more responsive to the pupils during the lesson. The reasons for this was his use of summary overheads to guide his lesson. Jona then reframed the problem of pupil disengagement in the third reflective teaching cycle not in terms of poor lesson planning but in terms of an over-dependence upon the lesson plan itself. Before the fifth cycle, Jona had often taught with his lesson plan 'in-hand' and frequently referred to it during the lesson. By the end of the practicum Jona had deliberately opted for summary overheads to guide his practice instead of referring to the full text of his lesson plans during the class. For example, in one overhead he bracketed a set of key phrases with the word 'Why' to remind himself to elicit ideas from the pupils. In another overhead, he used different symbols down the left hand side to remind himself of different strategies to use at various stages. As he contrasted the difference between constantly referring to his lesson plan and his later use of summary overheads, he likened his first practice to strict adherence to biblical rules whereas the latter practice was guided more by a feel for the class:

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Jona: I put it ['Why' on the OH] to remind me to ask a question there.

Tony: Well, that's good.

Jona: I am trying to get away from using the sheet[31] all the time.

Tony: You are right because you are not using a sheet at all in this lesson.

Jona: No. I am standing over here by the overhead. The overhead is here, and the sheet is over here [pointing to the far side of the desk]. I left it there when I was standing on the other side of the overhead. I am trying to get away from that. I was talking to Steve[32] about it one day and it is like you have an agenda, sort of rules or things that you have to get through in the day. You know? That is your direction [but] you don't really know what you are doing; you follow the sheet like the bible. So, I am trying to get away from that. And what that means is putting little reminders on the overhead. It might be like sometimes you will see that I have a star . . . or where, I have written TPS: Think, Pair, Share. (J/G C5.6 Les/J, p. 5).

In short, the summary overheads enabled Jona to focus more on the pupils in the class than on the lesson plan *per se*. Jona's shift from rigid adherence to flexible use of lesson plans was captured in a series of comments in which he indicated an alternative approach for future practice (see Table 7).

Finally, Jona's reflection on his use of lesson plans also revealed a movement from a purely cognitive approach to teaching (technical, mechanical, and step by step) to an approach which included an affective element (a feel for the class). The final lessons of the Jona's practicum revealed a combination of these two elements.

Review of theme five - Lesson plans

Teaching is a complex activity. There is much to consider, prepare, and act upon for each class. A lesson plan is an important element of that process.

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31 Jona often referred to his lesson plan as 'the sheet.'
32 Steve as in the case of Steve (see preceding chapter).

The reflective theme examined in this section, explores Jona's perplexity as he discovered that his lesson plans did not cater for every contingency. For example, his lesson of the third cycle died slowly as one by one the pupils disengaged from the lesson. Experienced teachers, for the most part, are able to to respond quickly to such circumstances and can alter their lesson plan *in situ*. Less experienced teachers, however, are unable to respond as quickly and have fewer change-options at their disposal. How do students react? Jona, in this instance, chose to stick steadfastly to the lesson as planned in the hope that perseverance would bring it back to life!

Table 7. Jona's shift from rigid adherence to flexible use of lesson plans

Initial practice	Current practice
• At first you are talking about the mechanics in the classroom. It goes from the technical . . . (p. 1*)	• . . . to more of a feeling type thing, you feel what you are doing type thing. (p. 1*)
• Before it was a lot of mechanics. It was going through the motions, that is, 'What should I do next?' 'This is what I should do next.' (p. 2*)	• Now it is like, all right, 'This is what I should do now because it feels right, so that is what I should do.' . . . It makes sense! (p. 2*)
• Earlier on it was like 'What is the next step, what is the next step?' I think that you could probably best describe that as looking at the sheets I use. Most of the time, until recently, I was clutching a sheet; you know, 'What do I have to do?' (p. 2*)	• I don't need the sheet any more . . . it has become much more a second nature sort of thing. (p. 2*)

* From J/G C5.9 Post/J

As Jona contemplated the difficulties he encountered in the third cycle, he framed them in terms of being under-prepared. In the lessons that

followed, he tried to be fully prepared and to faithfully follow the details contained in his lesson plan. Still, there were occasions when his pupils became disinterested in the lesson. Over the course of the practicum, Jona shifted away from a rigid adherence to lesson plans to a more flexible use of overhead summaries to guide his teaching. As a result, Jona was more responsive to the pupils and was able to alter his lesson plans accordingly. After the fifth cycle, Jona reflected on this new approach and reframed his successes not in terms of being better prepared but in terms of being less dependent upon his lesson plans *per se*. He then argued that this allowed him to have more of a feel for the lesson and to respond more quickly to changing circumstances within the classroom.

There was only one additional factor that emerged from the analysis of this theme that enhanced Jona's reflection on his practice, namely, his empathy with the pupils. As Jona attempted to articulate his concerns about his teaching, he realized that he was five years removed from being a pupil himself. By mid-practicum, he had begun to question some of the assumptions he had made about the classroom setting and acknowledged that many assumptions did not match his current experience in the classroom: "I am still trying to get a grasp of how students think. I have got to get back into the mind of a 16-year-old" (J/G C2.6 Les/J, p. 10). As a result, Jona's concerns for his practice shifted from those of 'self' to those of 'others' which resulted in a very different sort of critique of his practice. For example, in the above theme, by problematizing his practice from the pupils' perspective, Jona devised an alternative practice that enabled him to be more responsive to the changing circumstances in the classroom. Thus, Jona's empathy with the pupils provided an additional dimension to his inquiry about his practice.

Summary

Table 8 provides an overview of the five reflective themes in the case of Jona. The table also provides a summary of the factors that enhanced or constrained reflection, related issues.

Table 8. Summary of results for the case of Jona

	Research Questions One and Two				Research Question Three	Related Issues
Theme	Precipitated by:	Framed in terms of:	Reframed in terms of:	Plan for future action:	Factors which enhance (E) or constrain (C) reflection:	
Direct instruction	Dissatisfaction with direct instruction	The pupils were found wanting	The method was found wanting	Using a combination of methods	• Pupil evaluations of Jona's teaching (E) • The use of video (E)	• Reflection does not always immediately alter practice
Levels of under-standing one's practice	Curiosity at wanting to 'pin down' his changing relationship with Gary	Pararellel movement by both to higher levels of under-standing	Jona moving to a level of under-standing commensurate with Gary	To consider both conceptual and technical aspects of teaching	• Jona's interaction with Gary beyond the classsroom (E) • Jona's active participation in his discussions with Gary (E)	
The link between objectives and themes	Surprise that the pupils were unable to 'see' the links	External factors over which he had no control	The need for an angle or thesis to connect the work	Regular reference to focal points that connect the work	• Stimulated recall (E) • Pupils as independent and critical thinkers (E) • Teaching multiple sections of a course (E) • Brief, unfocussed, unrec-orded observations (C)	
Ownership of one's practice	Concern that he was going to Gary too much	Not wanting to 'rock the boat' (i.e. Gary's practices)	Jona's attempt to find the 'right way' of teaching	Develop a plan that was distinctly his own	• Gary's support (E) • Realizing that the UBC method was a guide (E) • Jona's unquestioning use of set routines (C) • Utilitarian emphasis (C) • The practicum as a hoop-jumping exercise (C)	• The importance of recognizing Gary's teaching experience and knowledge
Use of Lesson plans	Concern for pupil dis-engagement	Under-prepared lesson plans	Rigid adherence to lesson plans	Use of summary overheads	• Jona's empathy with the pupils (E)	

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CHAPTER 9

Conclusions, Discussion, and Implications for Practice

The conclusions, discussion and implications for practice that appear in this chapter are drawn from the reflective practices of four student-teachers as they **prepared, taught,** and **discussed** their lessons in concert with their sponsor teachers, and then reviewed these activities through the use of video tape. This chapter is divided into four sections: conclusions emerging from the research questions, a discussion of critical issues arising from the study, implications for practice, and possibilities for future research. To facilitate the reading of the chapter all claims have been italicized within the text.

I. Conclusions emerging from the research questions

In answer to the first research question - What do student-teachers reflect upon? - three categories emerged: ownership of one's practice, the way pupils learn, and seeing practice through the eyes of an experienced teacher. In answer to the second question - What precipitated student-teacher reflection? - it was possible to identify up to four precipitants for each theme, the most significant being the 'secondary' precipitant at the reframing stage. In general, student-teacher reflection was precipitated when there was a contrast between what the student believed would happen and what actually happened. In answer to the third question - What factors enhanced or constrained student-teacher reflection? - the factors are grouped into three categories: student related, sponsor related, and program related factors. The results to each of the research questions are examined in greater detail below.

Question one: What did the students reflect upon?

Fifteen reflective themes, spread amongst the four students, were identified during this study. These themes have been grouped into three main categories of description (Table 9), two of which were particularly dominant: the ownership of one's practice, and the way pupils learn. One theme (namely, Sally's 'Passive interaction with her sponsor'), which did not 'fit' into the three main categories, and about which there was insufficient information to specify a new description, has not been categorized.

Table 9. Descriptive categories for the reflective themes

Descriptive categories	Themes			
	Sally	Tina	Steve	Jona
Ownership of one's practice	• Teaching orientation	• Ownership of one's practice	• Ownership of one's practice • Elicitation	• Ownership of one's practice • Direct instruction
The way pupils learn	• Pupil learning	• Questioning • Off-task behaviour	• Expectations of pupil knowledge	• Use of lesson plans • Link between themes and objectives
Seeing practice through the eyes of an experienced teacher	• Collegial interaction with sponsor			• Levels of understand-ing

Ownership of one's practice

The first category that emerged from the results was *the students' reflection on the ownership of one's practice.* Ownership of one's practice was characterized as a shift from 'a dependence upon' to 'an independence from' either traditional classroom practices or the practices of the sponsor teacher. In the cases of Sally, Tina, and Steve, this shift was initiated by the student. In the case of Jona, it was initiated by the sponsor. In all four cases, the movement to an independent practice was accompanied by increased levels of anxiety as each student struggled to define a practice that was uniquely his or her own.

The way pupils learn

The second category that emerged from the data was the *students' reflection on the way in which pupils learn.* Reflection in this category was characterized as a shift from a teacher's perspective to a pupil's perspective on the way in which pupils learn. The issues around which these reflections

took place included pupil learning, lesson content, lesson planning, and classroom behaviour.

<u>Seeing practice through the eyes of an experienced teacher</u>

A third pattern that emerged from the data, was *the students' reflection on their ability to see teaching through the eyes of an experienced practitioner.* This category was characterized by a shift in the students understanding of practice to progressively higher levels that were commensurate with their sponsor teachers' understandings of practice. Both Sally and Jona reflected upon this issue. Both students recognized that they were interpreting aspects of their practice quite differently at the end of the practica as compared to the beginning of the practica, and that they had come to see their teaching as if through the experienced eyes of their sponsor teachers.

Question two - What precipitated the students' reflection?

Question two proved to be more difficult to answer than was first anticipated. The reason for this difficulty was that up to four precipitants could be identified with the reflective activity associated with each theme.

<u>Precipitants for each theme</u>

For each reflective theme it was possible to identify a primary and secondary precipitant at each of the framing and reframing stages. In some instances there was repetition of the precipitants over the two stages. Thus, the primary precipitant at the framing stage might also be the primary precipitant as the reframing stage. Primary precipitants were usually extra-subjective and of an informal nature (e.g., an incident on video or a casual comment by a sponsor teacher). Secondary precipitants were more subjective and of a formal nature (e.g., students internalized the issue and explicitly referred to it). An example of a theme with four different precipitants was Sally's reflection on her teaching orientation. The various precipitants for this theme are listed in Table 10.

Table 10. An example of primary and secondary precipitants

Reflective theme components	Descriptors
• Theme:	Teaching orientation
• Precipitant:	Internal dissonance between belief and actions*
• Frame:	Having a teacher-centred focus
Primary precipitant:	Watching a video of her classroom teaching
Secondary precipitant:	Sally noting her lack of interaction with pupils
• Reframe:	Teaching the way she was taught
Primary precipitant:	John's intention to focus on pupil questioning
Secondary precipitant:	Sally's noting the dissonance between her beliefs and actions
• Plan for future action:	To reconcile her beliefs with her actions

*The secondary precipitant at the reframing stage is regarded as the main precipitant for the theme

Sally's reflection on her teaching orientation was initially precipitated by watching a video of herself teaching (primary precipitant - framing stage). Watching the video precipitated Sally's comment that there was a lack of interaction between herself and her pupils (secondary precipitant - framing stage). The secondary precipitant resulted in Sally's critique of her teaching in terms of its teacher-centred orientation (the frame). Sally's reframing of her orientation to teaching was initially precipitated by John's comment that he intended to focus on Sally's questioning strategies (primary precipitant - reframing stage). This comment precipitated Sally's articulation of a dissonance between her beliefs about teaching and her actual practice in the classroom (secondary precipitant - reframing stage). As a result, Sally reframed her teaching in terms of teaching as she was taught (the reframe). Thus, Sally's reflection was a product of primary and secondary precipitants at both the framing and reframing stages.

This pattern of precipitants was evident in all themes identified in this study. Further, it was the secondary precipitant at the reframing stage that appeared to be the most important in terms of the students' reflections and

their subsequent plans for future action. Therefore, in each of the themes, the secondary precipitant at the reframing stage is referred to as the main precipitant for the theme. The explication of precipitants in this way provides a new insight to student-teacher reflection. In short, the results of this study indicated that *up to four different precipitants could be identified for each reflective theme; a primary and secondary precipitant at each of the framing and reframing stages. Of the four precipitants identified, it was the secondary precipitant at the reframing stage that appeared to be the most influential in terms of the student-teachers' reflection on their practices.*

A contrast between what is proposed and what happens

In general, *the reflective themes in this study were precipitated when there was a contrast between what the students anticipated would happen and 1) what actually happened, or 2) what the sponsor teachers suggested might happen.* In the first instance, it was the student-teacher's actions in the practice setting that highlighted this contrast. In the second instance, it was the sponsor teacher's comments in relation to the student's proposed actions that highlighted this contrast.

Further, although it was possible to identify what precipitated the reflective themes, it was difficult to an assign appropriate descriptors for each of the precipitants[33]. What, at one point, might be regarded as 'intrigue,' a short time later might be regarded as 'curiosity.' Or, what at one point what appeared to be 'conflict', at another point appeared to be 'dissatisfaction.' The descriptors for main precipitants of the fifteen reflective themes are given in Table 11. The contribution that this study makes in this regard is to provide a broader range of descriptors than is typically encountered in the literature.

Question three: What enhanced or constrained reflection?

The factors which enhanced or constrained student-teacher reflection have been grouped into three broad categories: student-related, sponsor-related, or program-related. A factor was considered to enhance reflection if it contributed to the development of one of the four components of reflection (i.e., the precipitant, frame, reframe, or plan for future action). A factor was

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[33]   Definitions for the descriptors were taken from the Oxford Dictionary.

considered to constrain reflection if it limited the opportunities for the development of any of these components.

Table 11. List of precipitants for the reflective themes

Case	Theme	Main precipitants
Sally	Teaching orientation	internal dissonance
	Passive interaction	frustration
	Pupil learning	dismay
	Collegial interaction	surprise
Tina	Ownership	frustration
	Pupil knowledge	surprise
	Questioning style	conflict
	Off-task behaviour	contrast
Steve	Elicitation	curiosity
	Ownership	variance
Jona	Direct instruction	dissatisfaction
	Levels of understanding	curiosity
	Themes and objectives	surprise
	Ownership	concern
	Lesson plans	concern

Of the forty-six factors that were identified across the four cases, forty-three fell into one of three categories outlined above. Because of the idiosyncratic nature of three remaining factors, these are addressed in a later section entitled 'Possibilities for Further Research.'

Of the factors that were identified as enhancing or constraining student reflection, many were common to all four cases (e.g., the use of video tape). Also, many factors, while not identical, were very similar to other factors within and across cases (e.g., pupil empathy in the case of Jona, and 'one-to-one' interaction with pupils in the case of Tina). The conclusions that follow are drawn from the relationships between the factors within and across cases.

<u>Student-related factors</u>

The student-related factors that enhanced or constrained reflection are grouped under the following headings: the use of video, agenda setting, problem setting versus problem solving, the use of time, interaction with students and pupils, observation and dialogue, and making explicit past experiences. The reader is reminded that there is considerable overlap between the groups and that they do not represent discrete entities in and of themselves.

<u>The use of video</u>. The use of video tape enhanced the student-teachers' reflection on their practices in all four cases. Consider Figures 11 and 12. These figures provide a summary of the different sessions in which the students either framed or reframed issues.

From these figures, it is clear that the framing and reframing of many issues occurred mostly during the video recall sessions. The video recall of the lessons provided the students with an opportunity to examine their practices 'first hand.' In this sense, the tapes of the lessons acted as a primary data source[34]. Further, the tapes permitted the students to stop, start, and review sections of their lessons that were of importance to them. It was clear that the video recall of the lessons enhanced the students' reflection on their practices. This result is in accord with those of Kilbourn (1988) and Ross (1990).

The video recall sessions of pre- and post-lesson discussions also provided the students with an opportunity to 'put into their own words' what they understood their sponsor teachers to be saying. In the light of these

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[34]   A primary data source is, as far as is possible, free from interpretation from an observer. This stands in contrast to pencil and paper reporting which is a secondary data source in that it has passed through at least one level of interpretation (i.e., it represents what the sponsor teacher or faculty advisor 'saw'). The reader is reminded that the video tapes of the lessons were a primary data source only in so far as a wide-angled focus was used to collect the data.

Figure 11

Number of themes framed

6

5

4

3

2

1

Ownership			Lesson Plan
Elicitation	Ownership		Levels of Understand'
Collegial Interaction	Themes & Objectives	Direct Instruction	Off-task Behaviour
Pupil Learning	Teaching Orientation	Question Style	Pupil Knowledge
			Ownership
			Passive Interaction

Sessions in which the themes were framed

Pre-lesson discussions | Video recall pre-lesson discussions | Video recall lessons | Post-lesson discussions | Video recall post-lesson discussions | Pre-practicum interview | Mid-practicum interview | Post-practicum interview

Reflective teaching cycles   Additional interviews

Figure 11. Sessions in which framing occurred

Figure 12

Number of themes reframed

6

5

4

3

2

1

		Lesson Plan	Themes & Objectives
		Question Style	Levels of understand'
		Pupil Knowledge	Direct Instruction
Teaching Orientation	Elicitation	Ownership	Ownership
		Passive Interaction	Collegial Interaction

Off-task Behaviour
Ownership
Pupil Learning

Sessions in which the themes were reframed

Pre-lesson discussions | Video recall pre-lesson discussions | Video recall lessons | Post-lesson discussions | Video recall post-lesson discussions | Pre-practicum interview | Mid-practicum interview | Post-practicum interview

Reflective teaching cycles   Additional interviews
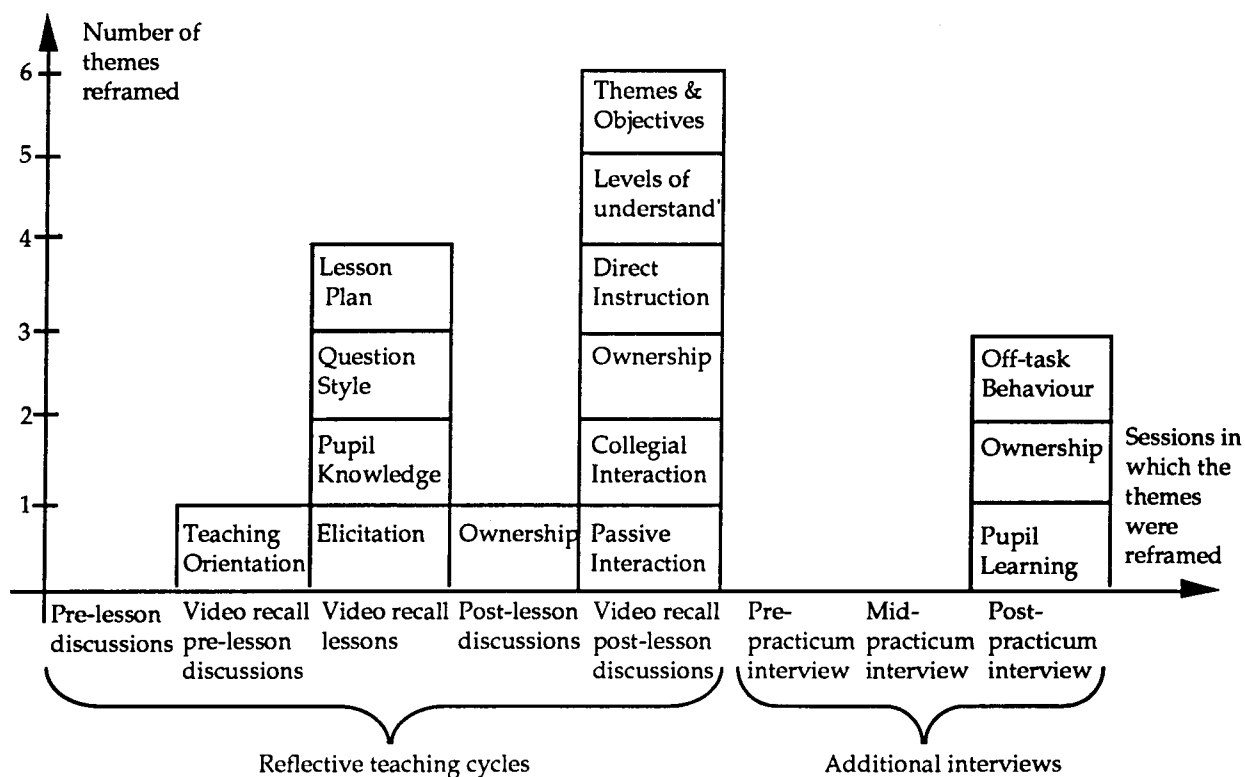
Figure 12. Sessions in which reframing occurred

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new understandings, the students often framed and reframed issues they found to be problematic in their own practice. An example of this was Jona's reframing of the relationship between themes and objectives. Although, there has been little work reported on the use of stimulated recall of pre- and post-lesson discussions, the students in this study benefitted from this experience. In short, *the use of video recall of both lessons and pre- and post-lesson discussion enhanced the students' reflection upon their practices*

Setting the agenda. An examination of the transcript data indicated that the students and sponsors raised many issues about the students' teaching practices. Of the issues raised, fifteen developed into and were identified as reflective themes. Of these themes, ten were initially raised by the students and five by the sponsors (see Table 12). An inspection of Table 12 reveals that of the four issues that Sally reflected upon all four were raised by her; Jona raised three of the five issues he reflected on; and in the cases of Tina and Steve there was an even split between the issues that were raised either by the sponsor or student. In short, *when students gave voice to issues that concerned them, they reflected on the same number of issues, if not more, than those raised by their sponsors.* The importance of 'student voice' in relation to reflection upon practice has also been highlighted in other studies (Cole, 1989; Holland, 1989a; Schön, 1987).

Students giving voice to their concerns also appeared to be related to the degree to which they actively participated in the pre- and post-lesson discussions. There were times when the students listened but did not actively participate in those discussions. The clearest example of this was in the case of Sally in which her participation was limited to 'minimal positive responses.' Further, when the students were passive participants in pre- and post-lesson discussions, the agenda for those discussions was set primarily by the sponsor teachers.

Given the tendency for students to be more reflective about the issues they raised as opposed to those raised by their sponsors, the important of student voice and active participation are critical in the determining who sets

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the agenda for the pre- and post-lesson discussions. Specifically, *the reflective*

Table 12. Reflective themes initiated by student and sponsor

Case	Reflective theme	Issue raised by:	
		The student	The sponsor
Sally	Teaching orientation	✓	
	Passive interaction	✓	
	Pupil learning	✓	
	Collegial interaction	✓	
Tina	Ownership	✓	
	Pupil ownership	✓	
	Questioning		✓
	Off-task		✓
Steve	Elicitation		✓
	Ownership	✓	
Jona	Direct instruction	✓	
	Levels of instruction	✓	
	Themes and objectives		✓
	Ownership		✓
	Lesson plan	✓	

practices of the student-teachers in this study were enhanced when they were actively involved in the agenda setting process in the discussions about their practice. These results are consistent with other studies. For example, Zeichner (1987a) argues that students are more reflective when they are proactive not merely reactive to the settings in which they undertake their practica.

Interaction with students and pupils. Students' interactions with fellow students, and with the pupils they taught, provided alternative perspectives with which to examine different teaching practices. Informal student-teacher networks provided the students with a rich resource of ideas for this sort of examination (e.g., Tina's ownership of her practice). A number of studies have highlighted the importance of this type of interaction during the

practicum (Comeaux & Peterson, 1988; Feiman-Nemser, 1986; Pugach & Johnson, 1988). For example, Feiman-Nemser (1986) argues that peer interaction was an important factor for enhancing reflection because it casts reflection as a collaborative process rather than a purely personal or individual act. The students use of networks in this study underscored the value of sharing one's teaching experiences with fellow students.

Another level of interaction that enhanced the students' reflection on their practices was their interaction with the pupils. This interaction was particularly noticeable in the cases of Tina and Jona. In the case of Tina, her one-to-one interaction with the pupils, especially during her use of co-operative learning, provided her with a perspective on teaching that may not have been possible through more traditional approaches to teaching. Similarly, Jona's empathy with his pupils provided him with an alternative perspective on his practice (e.g., his use of pupil questionnaires to evaluate his teaching furnished him with important feedback about his practice). Jona's close interaction with the pupils also provided him with important *in situ* feedback (e.g. the Maria incident). The importance of interactions with pupils has been reported by other researchers who have used case studies and narratives to engage students in one-to-one interactions with pupils (Beyer, 1984; LaBoskey & Wilson, 1987). The results of this study are consistent with these reports and indicate that *the students' interaction with both fellow students and pupils enhanced their reflection by providing them with alternative perspectives from which to examine their practices.*

Problem setting versus problem solving. While on-campus course work provided the students with generic approaches to problems encountered in the practice setting, these approaches did not always provide answers to specific problems related to the students' practices. Further, an over-reliance on a generic or, what Schön would refer to as, a technical problem solving approach, at times led to frustration and disappointment. For example, in the case of Tina, her early reliance upon her sponsor teacher's co-operative learning strategies did not 'solve' the problems peculiar to her own practice.

Further, a technical problem solving approach resulted in a utilitarian emphasis in the students' teaching practices (i.e., a 'what works' approach to

teaching). For example, this was evident in the case of Jona, when early in the practicum he regarded his teaching as a 'hoop-jumping' exercise and later when he attempted to replicate the practices of his sponsor teacher. In the case of Steve, this approach was manifest in his reliance upon traditional classroom practices gleaned from his prior experiences as a learner. In the case of Tina, it was evident in her early reliance upon co-operative learning strategies. Only when the students began to attend to the specific features of their own practice did their inquiries shift from a generic or technical problem solving approach to a problem setting approach. When students began to ask questions such as 'Why am I doing this?' or 'What effect is this having on my class?' they began to examine assumptions about their practice that they had, hitherto, taken-for-granted. The importance of problem setting as opposed to technical problem solving is, of course, a tenet of Schön's argument for a new epistemology of practice (i.e., reflective practice). It was clear from this study that the students attention to problem setting enhanced their reflections on their practices.

The students approached problem setting in a variety of ways. A particularly interesting strategy was their use of negative cases (i.e., the students articulated an alternative practice by describing what they *did not* like about their current practice). All four students used negative cases as a strategy for problem setting (e.g., 'pupil learning' for Sally; 'questioning style' for Tina; 'elicitation' for Steve; and 'direct instruction' for Jona). However, the use of negative cases was more predominant in the case of Steve, than it was in the other three cases. The students' use of negative cases enabled them to make explicit, to frame, and to reframe, issues in their teaching that were new or unfamiliar to them. They were able to express what a new issue was 'like' by describing how it differed from something with which they were familiar. This is a variation on Schön's (1987) notion that:

> To see *this* [situation] as *that* is not to subsume the first under a familiar category or rule. It is rather, to see the unfamiliar situation as both similar to and different from the familiar one, without at first being able to say similar or different with respect to what. The familiar situation functions as a precedent, or a metaphor . . . an exemplar for the unfamiliar one. (p. 67)

The students use of negative cases resulted in the construction of new frames to account for the 'unfamiliar.'

In sum, *the students' reflections on their practices, were enhanced when the nature of their inquiries shifted from a generic or technical problem solving approach to a problem setting approach. One of the strategies the students found useful in the process of problem setting was the use of negative cases.*

Observation with dialogue. It is ironic that, while many students dialogued with their sponsor teachers on a regular basis throughout the practicum, the students' observations of their sponsors' teaching practices typically ceased after the first few weeks on practicum. An instance of the problems associated with the separation of dialogue and observation occurred in the case of Steve. Throughout the practicum, it appeared that Steve and Cliff shared a common understanding of brain-storming - an activity in which a teacher elicits responses from the students about a particular issue. Indeed, the notion of brain-storming came up in several discussions during Steve's practicum. It wasn't until late in the practicum that Steve, after observing one of Cliff's classes[35], began to appreciate that Cliff's conception of 'brain-storming' differed from his own. Thus, while dialogue throughout the practicum provided an opportunity for Steve and Cliff to make explicit their notions of 'brain-storming,' it was only through observation, later in the practicum, that Steve began to realize the difference between his own and Cliff's conception of brain-storming. Similar incidents occurred in the cases of Sally and Tina.

While there was a tendency for the students to observe fewer classes taught by the sponsor teachers as the practicum progressed, there was also a tendency for the sponsor teachers to observe fewer of the students' classes. One reason for this was that sponsor teachers felt that it was important for students to 'go it alone' in the classroom; to develop a sense of confidence in

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[35] Steve did not regularly observe Cliff's classes after his first few weeks on practicum and it was only because Cliff was being video taped on this occasion that Steve observed this particular class. This observation was in the ninth week of the practicum.

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their own practice without the sponsor teacher being present in the classroom. While going it alone is undoubtedly a useful experience, the cyclic observations that were a part of this research project indicated that the students' reflections were enhanced when regular dialogue was accompanied by observation. The importance of dialogue for convergence of meaning between student and sponsor has been reported elsewhere (Driver & Bell 1986; Erickson & MacKinnon, 1991; Ross, 1990; Schön, 1987) and Schön (1983, 1987) has written at length on the value of observation (e.g., the Follow Me model for coaching reflective practice). This study has demonstrated that *the complementary practices of observation and dialogue, by both student and sponsor, enhanced the student-teachers' reflection on their practices.*

The time available for reflection. There were two aspects of the student-teachers' practica experiences that impinged upon the time available for reflection: the difficulty they had with the content material they were given to teach, and the range of classes that they were given to teach.

In the first instance, the students' difficulty with content often meant that a considerable amount of time was spent 'boning up' on content at the expense of pedagogy. A clear example of this was Sally's pre-occupation with the content required to teach IB Chemistry 11. Sally, by her own admission, often worked until very late at night reviewing the material for the next day. Similar situations occurred in all four cases. This issue is not new in teacher education and has been noted by other researchers (Borko et, al., 1988; Shulman, 1986b). It was clear, that the students' difficulty with the content impinged upon the time available for them to reflect on substantive aspects of their practice.

In the second instance, the students' teaching loads, particularly towards the end of the practica, also impinged upon the time available for reflection. While there are benefits in having the students work towards a full teaching load with a range of classes, when it is at the expense of reflection an increased workload seemed to be detrimental to the students overall professional development. This result is consistent with other studies investigating workload and 'time press' (Campbell et al., 1990; Feiman-Nemser, 1986; Niles et al., 1987).

One way to address the constraints of difficulties with content and high workloads, is to have the students teach more than one class of the same course. The benefits of this strategy were obvious in the case of Jona, and to a lesser degree in the cases of Tina and Steve. Teaching more than one class of the same course reduced preparation time and enabled the students to spend more time addressing the pedagogical aspects of their teaching. Also when students taught multiple classes of the same course, the emphasis on content diminished after teaching the first class and shifted to a broader discussion of teaching practices for the second and third classes; a shift from 'What do I have to teach?' to 'How might I teach it better?' Thus, the results of this study indicate that *difficulties with content and high workloads impinged upon the time available for reflection. Alternative uses of time, such as teaching more than one class of the same course, may overcome some of these constraints.*

Making explicit past experiences. Making explicit one's past experiences as a learner (either in a school classroom or a university lecture theatre) provided the students with a basis for problematizing their teaching practices. In the case of Jona, problematizing his past experiences resulted in a critique of the university mentality that pervaded his teaching; for Sally, it was the realization that she was teaching as she was taught; and for Tina, it was an explication of her personal preference for a particular learning style. In all three cases, the students drew upon their past experiences as learners to examine taken-for-granted assumptions about their current practice. The importance of making explicit past experiences has been reported in many studies (Cole, 1989; MacKinnon, 1987; Russell et al. 1988; Sergiovanni, 1985) and is consistent with Schön's (1988) argument for a new epistemology of practice in which practitioners draw upon past experience and new knowledge to frame and reframe routine and non-routine aspects of their practice. Simply put, in this study, *student-teacher reflection was enhanced when the students made explicit their past experiences as learners.*

Sponsor teacher related factors

Of the factors that were identified as enhancing or constraining reflection, a number were specifically related to the sponsor teachers. These

factors fell within two broadly defined categories: inquiring into rather than reporting on the students' practices, and trust, support, and confidence in the student.

Inquiring into rather than reporting on practice. One of the assumptions inherent in the notion of supervision of student-teachers is 'reporting on' (in the formative sense) a student's practice. Such reports provide valuable feedback to the students. In this study, three of the four sponsor teachers were surprised at the length and depth of their reporting. Further, as they watched the video tapes of their discussions with their students they were alarmed at the extent to which their reporting left little time for the students to actively interact, react, or even act, during the discussions. The sponsor teachers framed this reporting 'phenomena' in terms of dominating the discussions with their students. Each sponsor reflected on his or her dominance in different ways. For example, Cliff saw his dominance in terms of wanting to fill the gaps in the discussion; Jason framed it in terms of his failure to model the very practice that he was asking Susan to demonstrate in her classroom, and Linda saw her dominance, particularly later in the practicum, as a indication of her possessiveness of certain classes.

A characteristic of the change in supervisory practices, as a result of sponsor teachers recognition of their dominance, was a shift from **reporting on** to **inquiring into** the students' practices. As this change occurred the students became more actively involved in discussions with their sponsor teachers and began setting their own agenda for those discussions. The importance of inquiring into practice is an essential component of Schön's second and third models for coaching reflective practice (i.e., Joint Experimentation and Hall of Mirrors). In short, *the sponsor teachers' shift from 'reporting on' to 'inquiring into' the students' practices enhanced the students' reflection on their practices.*

Trust, support, and confidence. A characteristic of the student-teachers' reflections, as identified in this study, was the focus on problems and difficulties encountered in the practice setting. Rarely did the student-teachers' reflections focus on their classroom successes. Further, their reflection tended to emphasize the uncertainties and doubts they faced in

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their teaching. After reading the case studies contained in this thesis, one might be forgiven for thinking that Sally, Tina, Steve, and Jona enjoyed little success while on practica. Indeed, the situation was quite the opposite They were successful during their practica. They were confident, assured, and reflective teachers. Three conditions were identified that enhanced the students' confidence in and reflection upon their practices, namely, the trust, support, and confidence that the sponsor teachers had in the student-teachers' practices.

As the sponsor teachers' trust, support, and confidence in the students increased, the students began to share and make explicit rather than withdraw and hold tacit their concerns about their teaching. The importance of a supportive environment, such as this, for the development of reflective practitioners has been noted by a number of researchers (Erickson & MacKinnon, 1991; Schön, 1988; Wildman et al., 1990). It was clear, in this study, that *the sponsor teachers' trust, support, and confidence in the students' abilities enhanced the students' reflection on their practices.*

One factor that facilitated these conditions, that was identified in this study, was the sharing of activities by both sponsor and student beyond the classroom; this sharing included activities that were both curricula (workshops, etc.) and extra-curricula (coaching sporting teams, etc.) in nature. This is consistent with reports that indicate reflection is enhanced when the students begin to appreciate the 'cultural milieu' in which their teaching takes place (e.g., Atwell, 1988; Houston & Clift, 1990).

Program related factors

In the case of Sally and Tina, one factor that enhanced their reflection was related to the on-campus teacher education program that they undertook prior to the practicum, namely, method courses that linked theory to practice.

Method courses that linked theory to practice. It became apparent in the first year of the study that the science method courses which both Sally and Tina took had a considerable impact on their reflection. This was evident in the themes on 'pupil learning' (Tina), 'questioning style' (Tina), and 'teaching orientation' (Sally) The courses went beyond methods *per se* and

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related the methods to specific theoretical perspectives on teaching and learning. The association between theory and practice provided Sally and Tina with a heuristic for examining different teaching practices[36]. The importance of method courses in this regard has been the subject of other studies (Krough, 1987; Ross, 1990, Zeichner & Liston, 1989). Thus, *method courses that made explicit the links between theory and practice enhanced the student-teachers' reflections on their practices.*

II. Discussion of critical issues arising from the study

The reflection documented in this study indicates that Schön's notion of reflective practice is applicable to the professional development of student-teachers in practica settings. There are three areas in which this study extends Schön's conception of reflection as it applies to the practicum setting, namely: the thematic nature of student-teacher reflection, the ownership of one's practice, and the planning setting versus the performance settings in terms of Schön's coaching models.

The thematic nature of student-teacher reflection

When this study was first conceptualized, it was couched in terms of identifying reflective incidents. There was an expectation by the researcher, for reasons that will be explored shortly, that it would be possible to identify reflection during the course of a single interview or stimulated recall session. However, it soon became apparent that the term reflective incident was both misleading and inappropriate. Consider Figure 13 which is a composite map of the themes identified in this study.

What is immediately apparent is the temporal nature of reflection; some themes spanned two weeks, some a full thirteen weeks. In particular, different components of reflection arose as incidents within cycles, and emerged as themes across cycles. Therein resides the confusion between the term reflective incident and reflective theme.

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[36] There was a change in the instructors of the method courses during the second year of this study and it took a further twelve months before the theory/practice emphasis was established again. This may account for the absence of this particular factor in the second year of the study (i.e., the reflections of Steve and Jason).

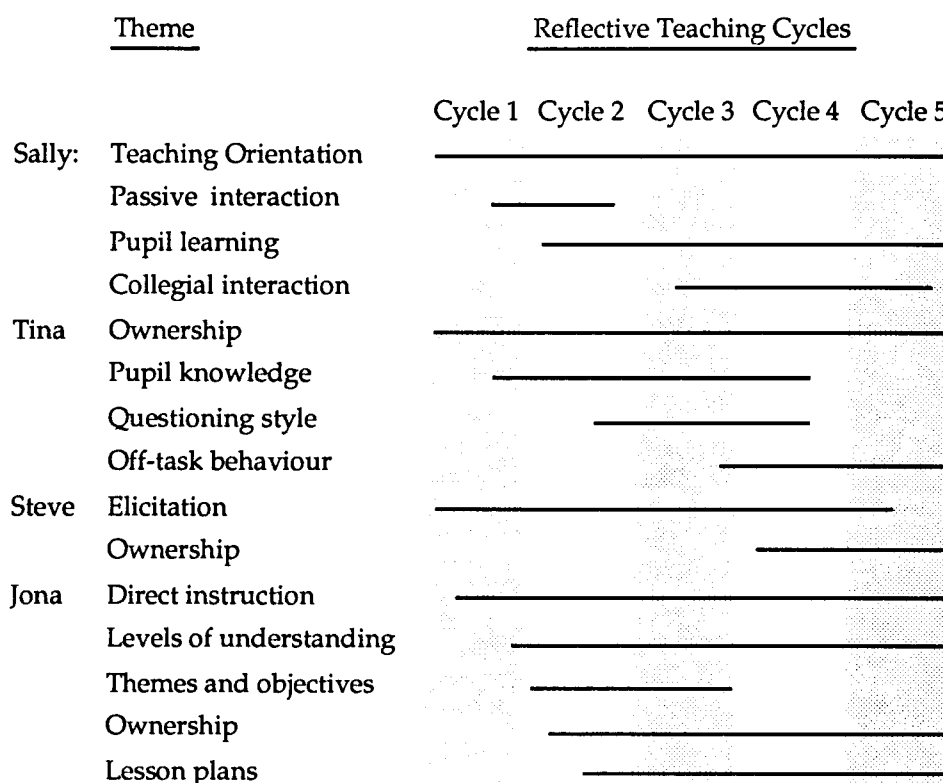| Theme	Reflective Teaching Cycles				
	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5
Sally: Teaching Orientation					
Passive interaction					
Pupil learning					
Collegial interaction					
Tina Ownership					
Pupil knowledge					
Questioning style					
Off-task behaviour					
Steve Elicitation					
Ownership					
Jona Direct instruction					
Levels of understanding					
Themes and objectives					
Ownership					
Lesson plans					

Figure 13. Composite map of themes from the four case studies

The incidents arose as the result of activities in a lesson, discussions with a sponsor teacher, the video recall of a pre- or post-lesson discussion, etc. These incidents were critical as they often resulted in the students bringing new frames to bear on issues related to their practices[37]. For example, the Maria incident in the case of Jona resulted in Jona reframing his notion of the relationship between unit themes and lesson objectives. Associations that the students made between related incidents became reflective themes over time. The themes identified in this study indicate that *reflection is born of incidents but is thematic in nature*. This brings some conceptual clarity, at least for this researcher, to the use of the terms **incident** and **theme** as they pertain to student-teacher reflection.

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[37] Indeed, there is a body of literature entitled 'critical incidents' that address such occurrences during student-teachers' practica (e.g., see Wideen et al., 1990; Pajak, 1988; Housego, 1987).

Conceptualizing reflective practice in terms of its thematic nature has important implications for the supervision of student-teachers. For example, it would be difficult, if not impossible, to determine whether or not a student was reflective through occasional drop-in visits to the student's classroom. Alternative supervisory practices to occasional visits would need to be enacted if the identification and development of student-teacher reflection was to be a primary goal of a teacher education program[38].

The ownership of one's practice

There are a number of studies that have investigated the **nature** of reflection (i.e., 'why' and 'how' people reflect upon their practice) (Campbell et al., 1990; Grimmett, 1988; Krough, 1987; Lalik et al., 1989; Louden, 1989 MacKinnon, 1989; Ross, 1987; Shulman, 1988). Less attention has been given to the **substance** of reflection (i.e., 'what' people actually reflect upon). The results from this study have provided insights into both of these areas; the former is addressed above, this discussion will now consider the latter.

The intent of research question one - What is it that student-teachers' reflect upon? - was to investigate the **substance** of the student-teacher reflection. Previous studies on student-teacher reflection have shown that students typically reflect upon lesson content (Borko et al, 1987; Russell, 1988) and pupil learning (Freiberg & Waxman, 1990; Wildman, 1987; Erickson & MacKinnon, 1991). These results are consistent with one of the main categories of description that emerged from this study. The category entitled 'the way pupils learn' embraces the students reflections upon both lesson content and pupil learning. It was the second main category of description that emerged from the analysis of the data, that stands in sharp contrast to the other studies, namely, 'the ownership of one's practice.'

There has been little, if any, documentation, of student-reflection on the ownership of their practice. There are a number of possible explanations for this. For example, earlier studies in teacher reflection (regardless of the theoretical perspective adopted) were often conducted with in-service

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[38] A brief discussion of some practical issues related to the identification of incidents and themes is contained in Appendix D.

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teachers for whom ownership of practice may not have been an issue. Thus, as studies on reflection moved from the in-service to the pre-service setting, the issue of ownership may have been subsumed under existing categories or not recognized as an issue peculiar to pre-service setting. Another explanation may be the context in which studies in student-teacher reflection have taken place. If the practicum is not the primary setting for the study then the issue of ownership may not emerge. Whatever the explanation, the ownership of one's practice was a significant issue in this study upon which the students reflected.

The students' reflections upon ownership were manifest in the questions they posed about their practice; for example:

- Whose classroom is it?
- Whose pupils are they?
- Whose instructional strategies will I use, mine or the sponsors?
- Whose materials are they?
- Whose test is it?
- Whose teaching style should I adopt?
- Whose unit plan is it?
- Whose disciplinary strategies are they?
- Whose lesson is it?

As the students wrestled with the question of ownership, an interesting counter-situation emerged. The sponsor teachers began to ask themselves similar questions. Enmeshed within this dynamic was the sense of 'transfer,' specifically, the transfer of ownership from the sponsor to student (e.g., for establishing co-operative groups, for taking responsibility of tests and assignments, and so on.). This was particularly evident in the reflective themes that traced the students' shift from 'a dependence upon' to 'an independence from' the sponsor teacher. Central to this particular issue is that ownership must not only be **given** (i.e., by the sponsor) but must also be **taken** (i.e, by the student). For example, there were times when the sponsors were reluctant to give up ownership but the students were wanting to take it, and conversely, times when the sponsors wanted to give up ownership but the students were reluctant to take it.

The contribution that this study has to make in this regard is that: *(1)*
ownership of one's practice, in its various forms, constituted a substantial
component of the student-teachers' reflection in the practica setting, and (2)
reflection upon ownership emerged as a duality in which ownership needs to
be both actively given by the sponsor and taken by the student.

Broadly conceived, the notion of ownership, as used in this study,
reflects the way in which the students referred to the development of a
practice that was uniquely their own. Clearly though, referring to this
development in terms of ownership (or a transfer of ownership), while
useful for the students as they made sense of their practica experiences, is
overly simplistic. Ownership entails many things, for example:
responsibility, authority, and autonomy. And within each of these
dimensions there are varying perspectives, for example, responsibility might
be examined from a legal, moral, or educational perspective. Thus, while
ownership emerged as a central issue in the reflective themes documented in
this study, a more detailed examination of ownership in terms of its various
dimensions would be useful in further explicating student-teacher reflection
in practica settings.

Planning vs. performance and Schön's coaching models

The teaching practica that was the basis for this study, provided a more
complex dynamic than the settings in which Schön first explicated his
notions of reflective practice. Schön's work was primarily in 'clinical'
settings in which students were provided with relatively risk-free 'virtual'
worlds in which to experiment. Further, these settings were primarily
planning settings in which teacher and student worked on a particular task
(e.g., the design of a building, the preparation of a musical performance, etc.).
In these instances, the action upon which the students reflected was their
planning in a virtual world. The teaching practica, as reported in this study,
included both the **planning setting** and the **performance setting** (i.e., putting
into practice that which was planned). Therefore, the students' reflection
included both planning as action in a virtual world and performance as
action in the 'real' world.

What was particularly striking between Schön's rendering of reflective practice from the perspective of action in a virtual world and this study's examination of reflection as both action in a virtual world (of planning) and the real world (of performance) was the tenuous nature of the relationship between teacher and student that was associated with the movement between these two worlds.

The safety of the virtual world in which the student and sponsor planned lessons was, in part, consistent with Schön's description of the relationship between student and 'coach.' For example, there were instances of the first two coaching models, Follow Me and Joint Experimentation. What seemed to upset this dynamic was the student's movement from the virtual of planning to the real world of performance. In all four case studies, when the students moved from planning to performance, the relationships between student and sponsor oscillated enormously. Trust and comfort that was evident during a planning session suddenly became scepticism and distress in the performance setting. The shift from planning to performance was indeed, in the words of the students, **a reality check!** Assurances about pupil behaviour proved to be incorrect; advice on activities seemed to be insufficient; assistance with lesson content appeared to be inadequate; and so on. As a result, the relationships between the students and sponsors was given to abrupt starts and stops. Sometimes, these changes were marked by periods of silence (or non-participation) by the students during the pre- and post-lesson discussions; at other times, by quiet acquiescence to established routines and procedures; and yet at other times, by a radical departure from the advice that had been offered. Interestingly, the tensions in the relationships between the students and sponsors was significant in terms of precipitating a number of reflective themes in this study. But this tension is not readily apparent in the coaching models that Schön uses to describe the relationship between a student and his or her reflective coach.

The easy transition from one reflective coaching model to another, that was evident in the planning settings characteristic of Schön's work, was markedly absent as the students moved from planning to performance settings in this study. Thus, while Schön's three coaching models appear to capture the essence of the relationship between student and sponsor in the

virtual world of planning, the models do not fully account for the interactions between student and sponsor as the student moves from the virtual world of planning to the real world of practice. The results of this study suggest that *the conceptualization of the relationship between student and 'reflective coach,' as depicted by Schön, may need to be reviewed in the light of the difference between reflection upon action in a planning setting and reflection upon action in a performance setting.* A review of this kind might provide a more comprehensive picture of the potential contribution that supervisors are able to play in the development of the reflective practices of student-teachers.

III. Implications for practice

If teacher educators value reflection they must also address how reflection might be realized within the practicum setting. Clearly, time needs to be allocated to provide the students with an opportunity to reflect (Cole, 1989; Kilbourn, 1990; Nolan, 1989). However, allocating time, in and of itself, is insufficient to ensure that students become reflective practitioners; students must be provided with opportunities, structured or otherwise, to reflect on practice. In this section, the reader is invited to take a step back from the details of student-teacher reflection portrayed thus far, and to examine the four suggestions for providing opportunities for student-teachers to reflect upon their practices. These opportunities are addressed under the following headings: multiplicity of perspectives, intense examination of practice, theorizing about practice, and entertaining uncertainty.

Multiplicity of perspectives

The issue of seeing things from 'different perspectives' was prevalent in many of the reflective themes identified in this study. Access to different perspectives contributed to the students' framing or reframing of their practices. This is consistent with the research by Wildman et al. (1990) and Ross (1990). The different perspectives were gleaned from a number of sources: student-teacher networks, video tapes, interactions with pupils, making explicit one's beliefs about teaching and learning, etc.

Access or exposure to multiple perspectives stands in contrast to the suggestion that students need issues to reflect upon and that the supervisors

role is to set the agenda for such reflection. The reflection documented in this study suggests that *the role for supervisors in enhancing reflective practice may not be so much in pointing out what it is that students should reflect upon but in providing opportunities for students to view their practice from a multiplicity of perspectives.*

Intense examination of practice

The reflective teaching cycle was not intended as a model for the supervision of student-teachers but was to be used to gain insights into student-teacher reflection. However, the reflective teaching cycle did provided some insights into possible alternatives to current supervisory practices. In particular, the intense examination of a student's practice over a three day period seemed to be very productive in terms of providing the students with an opportunity to explore, in-depth, a number of issues related to their practices. Such in-depth exploration may not be possible with the more traditional weekly or fortnightly classroom observations by supervisors. Further, the students' reactions to the video tapes of the pre- and post-lesson discussions over the three day period, that encompassed the reflective teaching cycle, were quite fruitful in terms of enhancing reflection. Therefore, the results of this study suggest that *the student, sponsor, and advisor should designate a time(s) during the practicum when as a group they examine, in-depth, the student's teaching practice. This may require up to two or three consecutive days.*

Theorizing about practice

Another aspect of reflection that emerged as a trend in this study was the student-teachers' attempts to theorize about practice. These theories were not super-ordinate to practice but were grounded in and immediately relevant to the practices of the individual students. The students' did not reflect on issues related to the broader educational practices; for example, school policy, curricula organization, resource management, etc. (although these did impinge on their practice). The students typically addressed problems within their own realm.

Several factors contributed to this trend. The most significant was the students' attempts at problem setting as opposed to technical problem

solving. When the students began to attend to the particulars of their own practice (problem setting) they began to theorize about practice rather than drawing upon generic approaches to teaching (technical problem solving). Another factor was the students active participation and agenda setting in the discussions about their practice. When this occurred, the students began to articulate personal theories about teaching and learning.

The students use of 'negative cases' also provided an opportunity to theorize about practice by beginning with what was familiar and then constructing theories about the unfamiliar. Further, in the cases of Sally and Tina, methods courses that linked theory to practice provided the students with a heuristic for examining both current and developing theories about their practice. In turn, theorizing about practice provided the basis for substantive discussions about teaching practices that underlay many of the reflective themes identified in the study. Thus, *if reflective practice is to be an important aspect of the practica experience, students should be encouraged to theorize about issues that are immediately relevant to their own practice.*

Entertaining uncertainty

There are many criteria upon which student-teachers are judged to have reached (or not reached) a level of competence in teaching; for example, independence, confidence, etc. One of the overriding criterion in many faculties of education is for students to be reflective about their practice (Zeichner, 1987b). The results from this study indicate a key element of reflection is the ability of the students to entertain uncertainty. Only by entertaining uncertainty did the students in this study reflect on many of the themes identified.

Further, for the students to entertain uncertainty they need to feel comfortable in the their practica settings. The degree of comfort is determined, in part, by the level of of trust, support, and confidence that the sponsor teachers demonstrate in the students. These conditions underscore the importance of carefully selecting (and developing) environments in which to place student-teachers during their practica. Thus, entertaining uncertainty and the setting in which the practica takes place are interrelated and critical in the development of students as reflective practitioners.

Therefore, *the practicum should be a setting in which the opportunity for entertaining uncertainty is supported and recognized as an important element of professional development through reflection.*

V. Further research

There were two areas that emerged during the analysis that are worthy of further research attention: the idiosyncratic factors emerging from the cases, and the practicum as professional development opportunity for the sponsor teacher. Both are related to the reflective practices of student teachers in the practicum setting.

Idiosyncratic factors emerging from the cases

Three factors emerged in this study that were idiosyncratic to particular cases. The first emerged in the case of Jona, namely, brief, unrecorded, and unfocussed observations resulted in a technical emphasis upon practice (i.e., a 'what works' approach to teaching) by both sponsor and advisor. In the case of Jona, when the supervision of the student was casual it was the technical aspects of teaching that received the most attention in subsequent discussions. One reason for this seemed to be that technical aspects were easier to recall and speak to than substantive aspects of practice. By contrast, it seemed that extended, recorded, and focussed observations had greater potential for encouraging students to examine and reflect upon substantive aspects of their practice. A research project designed to determine the importance of different supervisory strategies (e.g., recorded versus unrecorded) in terms of student-teacher reflection might illuminate this issue and provide suggestions for appropriate supervisory strategies in the practicum setting.

The second and third idiosyncratic factors, both of which arose in the case of Sally, are related: the tacit nature of the sponsor's knowledge-in-action and the sponsor's emphasis on experiential learning. The central issue in both was the difficulty for the sponsor teacher to make explicit aspects his own practice for the student. The consequence was that Sally was encouraged to 'learn' about this knowledge by immersing herself in the practice setting; the emphasis being that the 'learning is in the doing.' The experience of this researcher suggests that this approach is prevalent in many practica settings. The knowledge that practitioners tacitly hold and how this knowledge might

be communicated to the student is addressed by Schön. However his approach differs to that of the sponsor teacher in the case of Sally. Instead of an immersion in practice, Schön argues that the sponsor teacher should use modelling as a first step in attempting to communicate this tacit knowledge. A research project with an emphasis on the sponsor teachers' tacit knowledge and the ways in they attempt to communicate this knowledge to the students might elucidate some of these issues.

The practicum as professional development for the sponsor

Although it was not the intention of this study to examine the reflective practices of sponsor teachers, it became apparent that the sponsors used the practicum as an opportunity to reflect on their own **teaching** practices. The potential for professional development in this regard has been noted by other researchers (Garman, 1982; MacKinnon & Erickson, 1988). The manner in which the sponsors seemed to reflect on their practices, as they supervised the student teachers, is illustrated in Figure 14.
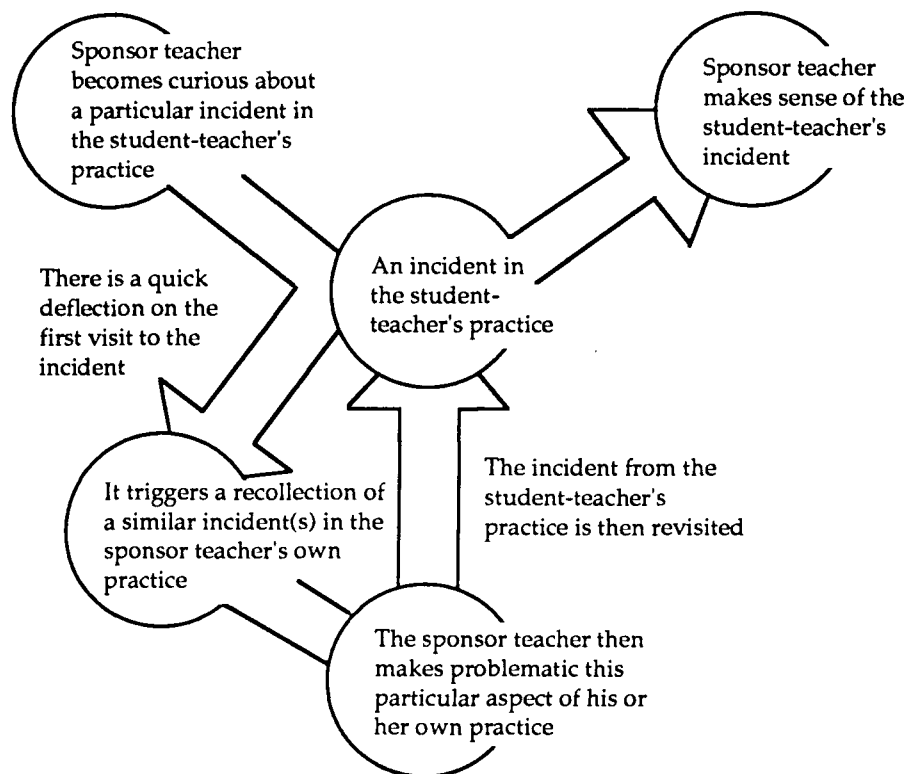

Figure 14. Professional development opportunities for the sponsor

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Typically, the sponsor teachers reflected on their own practices when they became curious about particular incidents in the students' practices. Such incidents triggered the recall of similar incidents in the sponsors' own past practices and, momentarily, deflected their focus from the students' practices. The sponsor teachers then made problematic these past incidents. Often, it appeared that this was the first time that the sponsor teachers had problematized these aspects of their practice. For example, Linda, as she attempted to explain an aspect of Tina's practice in terms of her own practice commented:

Linda: I have been doing it . . . for seven years. These things you take for granted. And it is kind of interesting that I could express it like that, because I have never had it to explain myself. (T/L C3.5 Les/W, p. 2)

Once the sponsor teachers' problematized their own practice they then returned to the original incident in the student's practice and drew upon the knowledge they had surfaced about their own practice in order to make sense of the student-teacher's practice.

Thus, the practica served as a professional development opportunity for both student and sponsor in this study. Where the present study has highlighted aspects of this development of student-teachers, the interplay between sponsor teacher and student-teacher for combined professional development in the practicum is worthy of further research attention.

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Appendix A - The Dual Role of Advisor and Researcher

In this study, the researcher was not only responsible for collecting the data but also acted as faculty advisor to the students. There was a potential for conflict between these two roles. For example, would the students be willing to share their uncertainties, doubts, and concerns with someone who would ultimately evaluate their performance on the practica (Cole, 1987; Gurney, 1989; Nolan, 1989). While there were potential disadvantages in having the researcher as faculty advisor, student comments appeared to indicate that these problems did not eventuate to any large degree. On the contrary, students saw advantages in the researcher acting as the faculty advisor; they had an advisor who had a 'stake' in their practica experience. The students viewed this relationship as a positive sign that the university was actively involved in their practica. For the researcher, the foremost advantage was that there was less variation and greater consistency in the supervision of the students, that is, the researcher was able to ensure that the influence of the faculty advisor was similar across all four cases. Further, by combining the two roles, the researcher had an additional 'window' into the student-teachers' reflections on their practice.

To minimize any detrimental effects that might result from the researcher as faculty advisor, every attempt was made to develop a relationship between student and researcher that allowed the students to feel as comfortable as possible in their work with the researcher. The intent of this was twofold: to minimize the 'fear of evaluation,' and to reassure the students that expressing doubts and concerns would not be judged as a weakness or failure on their part. To gauge the success or otherwise of these attempts an independent researcher interviewed each of the participants at the end of the practicum. The sections of the interviews relating to possible role conflict have been excerpted below. In general, the tenor of the students' comments indicated that there was little conflict between the dual roles played by the researcher.

Sally Interview III (excerpt p. 4)
    Bruce: How did you feel when you went into the project?

Sally: Ah, I was actually hesitant at first, but since Tony was sort of marking me as well like it wouldn't be a good thing to say 'No.' So it was OK, I thought it was quite valuable by the end, I think that everyone, practicum teachers as well, should be having a really close look, sort of an objective look, at how they are doing and what they are doing in the classroom, and what is actually happening, not just their perceptions. Like having a look at the overall classroom dynamics I thought was very valuable.

Bruce: How did you feel about Tony being an evaluator too?

Sally: I forgot about Tony being an evaluator actually. He is not an evaluator, he is more like a friend, I never saw him as an evaluator, I saw him as being one of my guides; helping me out?

Bruce: Coach?

Sally: Yeah, basically a coach, he is a coach.

Bruce: Did you see him in two roles?

Sally: No, no, he was basically Tony, my coach, my friend, the same guy.

Tina Interview III (excerpt p. 6)

Bruce: How did you feel about Tony being involved, I can count at least three people, as a researcher, he was an advisor, and a sort of 'off the record' telling you about his own ideas when you asked him. But did you find those roles kind of confused at all? Did one get in the way of another, or did you actually see him in those different roles?

Tina: I don't think they got in the way, I only saw it in separate roles when we would actually have a discussions watching the tapes and I would actually ask him "This is what happened to me when Wendy and I discussed this," or if I have a problem with what came up "Is this the way it should be", you know, I would ask a question about something, the [video] tape would go off, and then we would have a discussion about something. So, in that way that is the only separation that I saw. But I don't think it got too confused

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Bruce: How about in terms of evaluation because at the end of it all your supervisor has to do a summative evaluation, and was conducting some research as well. Was there anything in there?

Tina: I am not sure, I wondered I guess at the time if maybe from doing it if he was more critical of the two of us [Sally and Tina] because he has seen so much, so many problems that we would have, so many good things that we would do; was he more critical? Or was he more comfortable with the two of us because he had seen so much of us. I am not sure. That crossed my mind but I have no idea how it effected our evaluation.

Bruce: Well, you certainly did very well.

Tina: Hmm, mhh.

Steve Interview III (excerpt p. 5)

Bruce: What was his role in this? It seems to me he had a couple of roles, didn't he?

Steve: Yeah, he was, I would bounce ideas off him, he is not a science person *per se* but general teaching and application things, like, 'I am thinking of doing this, what do you think?' He was there, I think to provide support and he did. To point out things that you are doing well to build up your confidence.

Bruce: And yet he was also a researcher?

Steve: Yeah, exactly.

Bruce: He had a project of his own.

Steve: Yeah.

Bruce: So, with all the information he was gathering all the way through he probably had a really clear understanding of your practice, he observed you so much and collected so much documentation, but he also gets into a phase where he has to get into an evaluation.

Steve: Hmm, hmm.

Bruce: Did you find those two at cross purposes at all?

Steve: No, I didn't get any sense that he was there for him. Like he was doing a lot of things for himself, granted he is doing his

research, and it is primarily why he is here. But I never got a sense of that. He was primarily there to help me.

Bruce: Yeah.

Steve: Which sort of goes against that thing, [the suggestion I just made] that he did for himself, providing data for him. But I wouldn't say that was the case at all. He was there to support myself and Jona.

Bruce: And you felt that you could trust him really well.

Steve: Definitely. I feel that it if I had a problem I could go to him and say 'OK, I have this problem,' even something out of school context, it never happened but I feel that I could go to him.

Jona Interview III (excerpt p. 5)

Bruce: Tony was in kind of a different set of roles than what most faculty advisors would ever be in, he was both a researcher and a faculty advisor, he seemed to wear those two different roles.

Jona: Mhh, hmm

Bruce: Did you ever feel that they were in conflict, how did you feel about that? Did you see him in those two roles first of all?

Jona: Um, a lot of times I would sort of forget that he was a researcher still. You know, he was my faculty advisor, he would watch me, sometimes you even forget that because he was around so often. He was around a lot and at [another high school] where he had his other students. He was out there quite often but because he had all his equipment at our school, he was doing his work at our school. He was, of course, there most of the time so he was like a staff member almost.

Bruce: Yeah

Jona: So, you almost forget that he has any of those roles. It was a great situation with Tony because he was around so much. I knew that if he came in to watch me in a class, there wasn't this, you know, 'Oh my god, it's my faculty advisor, I have got to do really well because he only comes in four times in the semester and if I blow this one!'

Bruce: You have got to make them count.

Jona: I am going up in smoke. If I blew this class, I could say to Tony, you know 'Can you come back in tomorrow because I am doing it again tomorrow with a different class and there are some things that I want to change,' and he would be there. Unless he had some other commitment he would be there. And I'd know that I could blow a class and that he wouldn't necessarily take that as a representation of what kind of teacher I was. So, it was a terrific situation in that also sort of removed the fear of those two words 'faculty advisor' which some people had.

Bruce: Yeah.

Jona: So, in a lot of ways just his attitude is, his presence, you would almost forget that he was either one. But again he was my faculty advisor and he fulfilled that role extremely well. He helped me so much.

Bruce: And yet at the end of it all he had to pass some judgement.

Jona: Yeah, he was terrific, he really helped me a lot in my teaching, good comments both critical and he had praise for me as well, so he was very good at that. As far as a researcher, this you would sort of forget sometimes because he would blend in so well whenever he did his research, it just sort of happened.

Bruce: Mhh, hmm.

Jona: That as far as being a researcher it was hard to see sometimes.

Appendix B - Two Outcomes of the Member Checking Process

The prime purpose of the member checking process was to confirm that analysis of the data resonated with the participants in the study. There was a minimum of three mailings of the case study chapters to the participants. The feedback that the participants provided after each mailing was incorporated into subsequent drafts of the chapters. The degree of resonance between the researcher and the participants in the final document indicates that the accounts rendered herein are a reasonable interpretation of the reflective practices of the students during their practica.

In relation to member checking process there were two outcomes. The first was an initial defensiveness that most participants exhibited on first reading the analysis. It appeared that this was due, in part, to the substance of the students' reflections; that is, typically, the students reflected upon difficulties they encountered in their practica. The students were defensive because the themes highlighted these difficulties and did not report the many successes that also occurred during the practica. The sponsor teachers were defensive because aspects of the analysis exposed their doubts and concerns about their own supervisory practices. In hindsight, it would be have been useful to forewarn the participants that an analysis of reflective practice tends to focus on problems encountered and, therefore, provides only one aspect of the total experience. Thus, researchers should be aware of the potential reactions to the first-draft-analysis and forewarn the participants of contents therein.

The second outcome was related to the process of negotiation that occurred between the participants and the researcher. The first draft of the analysis was for the 'participants' eyes only.' This was part of the ethical agreement that was established with each participant at the beginning of the project. As a result, despite the best attempts by the researcher, some poorly written material went out to the participants (poorly written in the sense that some editing and rewording by an independent reviewer would have markedly improved the reception of the first-draft). When a researcher works alone with a document for an extended period of time, 'researcher blindness' tends to occur (at least for this researcher); words and phrases

which have come to mean a particular thing to the researcher through the many hours of analysis, may mean something completely different to a first-time reader of the analysis. Some of the difficulties in this regard might have been avoided if an independent reviewer had read the analysis prior to it being shared with the participants. Thus, it would have been useful to include in the original ethical contract (between the participants and the researcher) an opportunity for an independent reviewer to vet the analysis before it was sent to the individual participants.

Interview excerpt demonstrating the merging of post-lesson discussions into pre-lesson discussions.

T/L C4.6 Post, pp. 5 - 8

Beginning of section

Line # Participant response

1   Linda: Talk to me about how you felt about block C.

        Tina: How did I feel about it?

        Linda: Mhh, hmm.

        Tina: I didn't get done what I wanted to get done, that was

5   one thing. I find that this scientific method is really tough.

        Linda: For them to understand?

        Tina: Yeah.

        Linda: How do you know that it is tough?

        Tina: Because when you, um, well the actual questions on

10   this work, trying to get the answers out of them was

                really hard. But a lot of that is maybe just because it is

                jargon. They may have an idea about it but it, maybe

                a different word or concept of what I am actually

                wanting them to think about, but some of the

15   questions are hard for them. Like one of the things that

                we had on there was 'three controls.'

        Linda: Yeah.

        Tina: And they couldn't. They kept wanting to say that the

                room temperature was the control, because that

20   makes sense, I mean to most people that is like.

        Linda: This is the same mould experiment that they did for me

                in Grade 8.

        Tina: Really [with much surprise].

        Linda: Yeah, my Grade 8's when we did the scientific method, all

25   of my Grade 8's at [the junior high] school had

                that exposure, so that would include people like [my last

                student-teacher], but all the [the junior high] people got

                this in Grade 8. And even in Grade 10 through a couple of

                other science teachers, and there was also a resource activity

30		that was in a resource binder quite a while ago. The kids should have been familiar [sic]. Did you feel that in your questioning that you could have actually pulled out all their knowledge about what was the scientific method. What were the components, and what the actually
35		components meant.
	Tina:	Yeah.
	Linda:	Do you think that your questioning actually pulled it all out.
	Tina:	Well, no, not in talking about it afterwards, I mean I didn't. When I handed it out I had two handouts to give them and I
40		thought at the time that, OK, this is like end of segment and we are going to start this. 'I am going to give you this handout,' yak, yak, yak, but when I started talking to them I was quite disappointed that they were just reading it off the paper.
45	Linda:	Did you want them to use the paper at all, or did you want them to put it away and you were just feeling them out for what they knew.
	Tina:	Yeah, I wanted them to just give me ideas, and then hopefully I was going to get the words out of that. And then
50		I wanted their own ideas. I wanted them also to just make note of the ones that we had decided that were important, so ideally they would have all yak, yak, yak, yak, and when I put something down they would all say 'OK, that word is down there.'
55	Linda:	So, I was a bit confused as to what the purpose was of giving them the handout and then having them star or circle underline the key words, and then having them become original because automatically they will start looking for the answers.
60	Tina:	Yeah.
	Linda:	And if the intention of the activity was to find out what they knew of the scientific method, then I would have had them put like on the back side of the page, right, I would have asked them 'As far as you know the scientific method,
65		list all the steps that are necessary, and where possible define

the terms. That could have been a quick two minute thing, and they would have laid their cards on the table.

Tina:	Mhh, hmm.

Linda:	And then what you could do is to go through that cycle you
70	had on the overhead and showed the loop where it says if you reject the hypothesis you go back and test it some more. If you had maybe shown that as a cycle, and just shown them the things, and then let them turn to the written part, then they could have identified the parts. But I guess
75	instinctually the kids tend to look ahead, read ahead, when like today in biology 11 when they didn't know the terms, they didn't know how to select, they started looking through their books.

Tina:	Yeah.

80	Linda:	That's kind of automatic. They know how to use resources now, what does she mean, am I interested at all, so I think that is what happened in biology 12, you gave them the stuff so they automatically started looking.

Tina:	Yeah.

85	Linda:	And then you had also given the direction of staring, or underlining, the words as we go through them, so the easiest way out for them I think, to not maximize your thinking is to look at what was available. So, I think that's what probably what happened.

90	Tina:	Yeah, it was.

Linda:	I would have said, you know how you said 'I don't want you to read this from the paper.' That would have been the perfect opportunity to say put it away and see what we can do.

95	Tina:	I sort of felt that at that point I was doing 'Here it is' [referring to the student looking up the answers on the sheet], and for one I thought, I wonder, to me it is something that is really shaky for them to verbalise.

Linda:	Yes.

110	Tina:	And I was wondering too if we would have had the verbal, um, explanations.

	Linda:	You mean have them talk? How would you have increased their verbal interaction?
	Tina:	I think probably a quick brain-storming would have been the
115		best.
	Linda:	Yeah.
	Tina:	From the beginning, anything you can think of, and just.
	Linda:	Brain-storm to you as the recorder, or brain-storm to their own individual tables.
120	Tina:	They could have talked about it first, and then we could have had a jumble of words all over the place, and then try and sort them out.

End of section.

Appendix D - Identifying Reflective Practice

Identifying student-teacher reflection was more difficult than had been anticipated. Little was immediately apparent! Schön's analogy of the 'swamp' to describe 'the field of professional practice' aptly captured the complexity of practicum. During the analysis, three issues were identified that hindered the process of identifying reflection: non-sequential disclosure of the components of reflection, the interrelatedness of the themes, and 'non-articulation' of one's thoughts. One issue was identified that facilitated the process: a 'shift' in the student's appreciative system. Each of these points is addressed below.

An assumption, made by this researcher, was that the four components used in this study to define a reflective theme (precipitant, frame, reframe, and plan for future action) would be disclosed by the participants in sequential order. It soon became apparent that this was not to be the case. For example, on occasions an initial frame was disclosed only after a student reframed an issue. Similarly, there were occasions when a student framed an issue and only later indicated what precipitated his or her framing of the issue. In short, identifying reflective themes was difficult because the students did not always disclose sequentially the various components of reflection.

A second difficulty that arose during the analysis of the data concerned interrelatedness of the themes. The students often drew upon different aspects of one theme as they reflected upon another theme. For example, in the case of Tina, her reflections on 'pupil knowledge' and 'questioning style' were almost inextricably intertwined during the practicum. A similar situation occurred in the case of Steve and his reflections on 'ownership' and 'elicitation.' Thus, identifying reflective themes was difficult because the themes were rarely discrete entities in and of themselves[39].

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[39] The reader is reminded that the themes identified in this study have been treated as being distinct and discrete for analytical purposes only.

The old adage of 'think before you speak' also made it difficult, in some instances, to identify the individual components of reflection. For example, Steve often articulated a plan for future action without verbalising the intermediate steps he had used in developing that plan (the assumption being that there were intermediate steps). This was in sharp contrast to the other students who articulated their struggles while attempting to make sense of their practice. It was easier to identify reflective themes, in terms of the four components of reflection, when the students articulated their thoughts as they worked through an issue or a problem.

Finally, one common point that emerged and which assisted in the process of identifying reflective themes was the **shift** in the students' appreciation of different phenomena. An example of a shift that occurred in all four cases was the shift in the student's appreciation of learning from a student-teacher's perspective to a pupil's perspective. Another example, in the cases of Tina, Steve, and Jona was a shift from dependence to independence in the ownership of their own practices. In the case of Sally and Jona, another shift was from a novice to an experienced practitioner's view of the practice setting[40]. This notion of a shift in the students' appreciation of phenomena is, of course, parallel to the notion of framing and reframing that constitutes an important aspect of Schön's (1983, 1987) definition of reflective practice. As a first-level analysis, or rule-of-thumb, recognizing reflection as a shift in the students' appreciation of phenomena might be easier than trying to identify specific frames or reframes. This notion of a shift was particularly helpful 'in the field' when access to video or transcript data was not readily available.

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[40] For a further explication of these shifts see the conclusions to research question three.