A STUDY OF THE IMPACT OF A RESIDENT TEACHER EDUCATION PROGRAM ON TEACHING SELF-EFFICACY, BELIEFS ABOUT TEACHING, AND SELF-REPORTED TEACHING BEHAVIOURS

by

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ABSTRACT

Despite the fact that few residents have any specific training in teaching skills, the majority of them have significant teaching responsibilities throughout their residencies. Although residents have a positive attitude towards teaching, and look forward to their teaching role, a number of observational studies have found that few residents exhibit teaching skills conducive to learning. This research study reports the development, implementation, and evaluation of a resident Teacher Education Program (TEP), and examines its impact on internal medicine residents, more specifically, on residents' (1) sense of teaching self-efficacy, (2) self reported teaching behaviours, (3) beliefs about teaching, and (4) interest in teaching. A quasi-experimental design was used and assignment of subjects (i.e., residents) was based on the existing Clinical Teaching Unit (CTU) rotation schedule. Theoretical guidelines for program development were based on several perspectives of adult education, and psychology. Most importantly, teaching self-efficacy was used as a motivational paradigm (Ashton, 1984), and was used as the main outcomes measure. The treatment group (n=11) attended weekly one hour seminars longitudinally over the course of their CTU rotation (for a total of six sessions). The program was run a total of three times over the course of
three rotations. General internal medicine residents had a positive outcome expectancy for teaching (i.e., teaching efficacy subscale). However, their efficacy beliefs concerning their own abilities as teachers was not rated as highly (self-efficacy subscale). Overall, residents had a positive attitude towards teaching. The resident TEP had no effect on residents' teaching efficacy beliefs which were already positive. It did, however, have a statistically significant effect on their teaching self-efficacy scores which was twice that seen in the control group (0.4 vs. 0.2). A significant pre- and- post difference was found for 5 of 15 questions on beliefs about teaching (vs. 1 of 15 for the control group), and for 2 of 4 questions on interest in teaching (vs. 0 for control group). Residents participating in the TEP had a large and statistically significant improvement in self-reported teaching behaviours scores (vs. no difference in control group). A correlation coefficient of 0.21 was found for the associated changes between teaching efficacy and self-reported teaching behaviours. A correlation coefficient of 0.66 was found for the associated changes between teaching self-efficacy and self-reported teaching behaviours.
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CHAPTER ONE: THE PROBLEM

Introduction: Statement of the Problem

This research study reports the development, implementation, and evaluation of a Teacher Education Program (TEP), and examines its impact on internal medicine residents\(^1\), more specifically, on residents' (1) sense of teaching self-efficacy, (2) self-reported teaching behaviours, (3) beliefs about teaching, and (4) interest in teaching.

A quasi-experimental design was used and assignment of subjects (i.e., residents) was based on the existing Clinical Teaching Unit (CTU) rotation schedule. A needs assessment was carried out on the control group (n=8) over the course of two rotations - the results of which are reported elsewhere (Arseneau, 1993). The content of the TEP was developed to meet residents' needs as determined by structured interviews and participant observation of the control group, as well as a review of the literature. Theoretical guidelines for program development were based on several perspectives of adult education, and psychology. Most importantly, teaching self-efficacy was used as a motivational paradigm (Ashton, 1984),

\(^1\) See page 15 for definitions of unfamiliar terms
and was used as the main outcomes measure. The treatment group (n=11) attended weekly one hour seminars longitudinally over the course of their CTU rotation (for a total of six sessions). The program was run a total of three times over the course of three rotations.

Rationale and Purpose of the Study

Clinical medical education follows the old adage of “see one, do one, teach one”, and much of the teaching is done by the trainees themselves. Residents carry the majority of this burden. Not only are they responsible for the daily aspects of patient care and their own education, but they are also charged with the supervision and teaching of junior housestaff (i.e., interns and medical students).

Successful “faculty” development programs, therefore, should acknowledge the important role of residents as instructors since they provide the majority of clinical instruction (Brown, 1970). Knight (1988) argues that no one is more available or better suited to teach medical students than residents. Although students may think that most of their learning is done through lectures or from pearls of wisdom passed on from attending physicians, the real basics of medicine are
acquired through the guidance and teaching of residents. Residents' proximity, in terms of level of training, to medical students make them ideal teachers. Residents also benefit from the educator role. Steward and Feltovich (1988) discuss the importance that teaching plays in residents' acquisition of clinical skills and knowledge. It also prepares them for teaching patients, and even for academic careers. Stritter, Shahady, and Mattern (1988) emphasize the important role that teaching plays in residents' professional development. The roles and responsibilities of residents can be likened to a three legged stool where balance must be struck to keep the stool from toppling over: (1) self education, (2) patient care, and (3) teaching. These three elements should not be seen as separate and distinct, however, as the interplay between them is important and the total is more than the sum of its parts. One could argue that the best education comes from active involvement in patient care and in the teaching of others. Patient care may also be improved through the active discussion between residents and students, and from the teaching and learning activities that ensue.

The teaching role of residents is not redundant with that of faculty (Stritter, et al., 1988). The roles of residents and faculty should be seen as complimentary. Residents tend to concentrate on daily patient care issues on a large number of
patients, whereas, faculty tend to stress in depth discussion and problem solving skills on a small number of patients.

That residents spend more time with students and are "closer" to their level does not necessarily make them effective teachers. Wilkerson, Lesky, & Medio, (1986) studied the teaching skills of residents during work rounds. They found that "residents exhibited few of the teaching behaviours that can enhance learning in a patient care setting" and that "resident(s) appeared to conceptualize teaching as a classroom activity and equate it to lecturing..." (p. 827). Lewis and Kappelman (1984) noted that residents most frequently use an authoritarian lecture style in teaching. Ironically, this was the residents' least favourite approach as learners. Medio, Wilkerson, Lesky, and Borkman, (1988) observed residents during work rounds, and noted that "...residents did not often intentionally use daily patient encounters for teaching" and when they did, they usually provided brief lectures, highlighting residents limited repertoire of teaching skills and the frequency of missed teaching opportunities (p. 215). It seems that residents fail to recognize and take advantage of "teachable moments" (Meleca & Pearsol, 1988, p. 188).

Residents should be encouraged to improve their teaching skills, and must learn to identify and take advantage of the
teaching opportunities during daily work rounds. Numerous resident teacher training programs have been reported in the literature (Bing-You & Greenberg, 1990; Camp & Hoban, 1988; Edwards, Kissling, Brannan, Plauche, & Marier, 1988; Lawson & Harvill, 1980; Lazerson, 1973; Medio, et al., 1988; Meleca & Pearsol, 1988; Pristach, Donoghue, Sarkin, Wargula, Doerr, Opila, et al., 1991; Sobral, 1989). Greenberg, Goldberg, & Jewett (1984) emphasize that the most important aspect of these programs is fostering, among residents, an awareness of, and a positive attitude towards, residents' roles as teachers.

The rationale for this study rests in the important role that residents play in the education of junior housestaff and the intimate relationship that teaching has with residents' other roles and responsibilities (i.e., self education and patient care). Yet evidence exists that residents may not be well prepared for their teaching role and that they may not appreciate its importance in their own education. Changing residents' "attitude" towards teaching has been suggested as the key to success of TEPs (Lawson & Harvill, 1980). However, the use of the word attitude remains nebulous in the medical education literature. The purpose of this study is to examine the impact of a TEP on internal medicine residents' attitude towards their teaching role. This requires a working definition of "attitude" within the context of residents' roles as teachers. It also
requires a reliable and valid instrument to measure changes in attitude as defined for the purpose of this study. Choosing attitude change as the major goal of a TEP has other implications. Defining and measuring changes in behavioural objectives may not be the most appropriate way to document changes in attitude. Other educational perspectives are likely more appropriate (e.g., constructivist, situated/social, andragogy), and will be reviewed in terms of program development. It remains important, however, to determine whether or not changes in attitude towards teaching are associated with changes in teaching behaviours. This will also be addressed as a research question in the study.

The content of the TEP was determined by the results of the needs assessment (Arseneau, 1993) and a review of the medical education literature, whereas the process of the TEP will be based on perspectives of adult education that promote changes in attitude towards teaching.

Background of the Problem

Despite promoting the importance of attitude, there has been no consensus on its definition as it pertains to residents' attitude towards teaching. Furthermore, none of the above
studies on resident TEPs specifically address "how" to change attitude.

Teaching "attitude" has been used as a catch all in studies of resident teaching. One study (Skeff, Campbell, Stratos, Jones, & Cooke, 1984) defined it as: a desire to evaluate and improve teaching; satisfaction with teaching, enthusiasm for teaching, awareness of teaching strengths, and awareness of teaching problems. Another group of investigators (Greenberg, et al., 1984) divided attitude into the following categories: (1) General attitude towards teaching, (2) Perceptions of (residents') role as a teacher, (3) Attitude towards teaching methods, and (4) Attitude towards improving clinical teaching. The categories variously include self-efficacy (e.g., confidence), self-reported behaviours, self-evaluation, interest in, and enjoyment of teaching among others. More recently, Bing-You and Harvey (1991) studied the relationship between residents' attitude (as measured by a questionnaire) and student ratings of the residents' teaching skills. The authors comment that they have included two questions "to measure a teacher's sense of self-efficacy defined by Ashton (1984)" (p. 96). Interestingly, several other items from their questionnaire could be interpreted as measuring self-efficacy. However, no attempt was made to group these items into a "self-efficacy scale." Like other investigators the attitude items of the
questionnaire included a mixture of perception, self-reported behaviour, interest, and enjoyment.

In many studies, the term attitude has been used indiscriminately and often mistakenly. I will use the word "attitude" to broadly describe all objectives that have to do with affect, feelings, values, and beliefs (Henerson, Morris, & Fitz-Gibbon, 1987). The study and TEP described in this thesis differs from those described above in two significant ways. First, it is based on a constructivist perspective of teacher education (cf., behaviourist). Second, it is concerned with changing (and measuring) one specific attitude: self-efficacy (Bandura, 1977). However, other aspects of residents' attitude towards teaching (i.e., perceptions of teaching role, and interest in teaching), as well as self-reported teaching behaviours were measured.

Development and Theoretical Basis of the Study

Constructivism

Philip C. Candy (1991), in his book, Self Direction for Lifelong Learning, discusses the implications of shifting from a behaviourist to a constructivist paradigm in education. From
the constructivist perspective learning is viewed as a qualitative transformation of understanding rather than a quantitative accretion, and learners are seen as active construers and "makers of meaning" (p. 250). The constructed system of personal meanings becomes the learners' guide for behaving. "Clearly it is one of the educator's roles to help learners to recognize incorrect, biased, or dysfunctional personal beliefs, so that the learner has the chance to change. This is a subtle and intricate process, however, which is not accomplished simply by confronting the learner, but it involves careful exploration in a non-threatening environment....Thus, constructivism in education is concerned with two things: how learners construe (or interpret) events and ideas, and how they construct (build or assemble) structures of meaning. The constant dialectical interplay between construing and constructing is at the heart of a constructivist approach to education..." (Candy, 1991, p. 266-272).

Therefore, from a constructivist perspective, "teaching" cannot really occur except by facilitating growth of understanding in the learner.

The constructivist perspective has several important implications for the development of a resident teacher
training program. It downplays the importance of facts and behaviours (as well as behavioural objectives). If the program is to have a lasting impact, new behaviours are important only in that they reflect a restructuring of the residents' understanding and belief system. Lectures are unlikely to achieve this end. Residents need to explore and define their current understanding of their roles as teachers. They need to be challenged to expand this "world view" in the hopes that their elaborated definition will impact on their behaviour. This can be accomplished by means that actively involve residents in the learning process, including discussion, brainstorming, role play, and microteaching.

Constructivism is not a single theory, rather, it is a group of perspectives that espouse many of the same underlying assumptions (see above). Donald A. Schon (1987), in his book, Educating the Reflective Practitioner, uses a constructivist perspective to develop a model for teaching "artistry" in the professions. He introduces the concept of "reflection-in-action". Rather than automatically doing something (i.e., without thinking about it), he points out the power of reflecting in the midst of action while one can still make a difference to the situation at hand. He suggests that "...what distinguishes reflection-in-action from other kinds of reflection is its immediate significance for action. In
reflection-in-action, the rethinking of some part of the (usually automatic process) leads to on the spot experiment and further rethinking what we do...” (p. 29).

One of the main goals of the TEP is to have residents think about the teaching/learning process, “reflection-on-action”, as well as thinking during teaching, “reflection-in-action.” Hopefully, this will serve as a stimulus for continued growth.

Self-efficacy

Although the construct of self-efficacy (Bandura, 1977) is usually considered within a situated / social perspective of education, like constructivism, it aspires to move beyond behaviourism by highlighting the importance of the cognitive process and the development of beliefs as a guide for actions.

Bandura’s social learning theory (1977) is based on the assumption that individuals develop outcome expectations and efficacy beliefs concerning their ability to cope (or perform) based on life experiences. Efficacy expectations come from four sources: (1) performance accomplishments, (2) vicarious experience, (3) verbal persuasion, and (4) emotional arousal. Performance accomplishments are the most
powerful source of efficacy expectations given that they are based on personal mastery experiences. Successes lead to an enhanced sense of self-efficacy, whereas, failures tend to extinguish it.

The cognitive processing of information is important in developing efficacy beliefs (cf., constructivism). Individual understanding of information (i.e., perception) is more important than the "objective" information. Successes must be viewed as resulting from skill rather than chance. Similarly, the perception of ability is important. Individuals who view success as the result of ability are more likely to strengthen efficacy expectations than those who view achievement as a result of extreme effort.

Patricia Ashton (1984) reviews the concept of teacher efficacy as a motivational paradigm for effective teacher education. She defines a teachers' sense of efficacy as "the extent to which teachers believe that they have the capacity to affect student performance" (p. 28). She comments that teachers are "surprisingly unreflective about their work", and that this should be a specific goal of teacher education programs (emphasis mine) (p. 31). This is in keeping with the concepts of "reflection-on-action / reflection-in-action" as goals within a constructivist approach to education. Reflection allows
teachers to gain insight as to what works and what doesn’t, thereby, helping them identify specific sources of efficacy beliefs.

Gibson and Dembo (1984) undertook a study to provide construct validation support for teacher efficacy. They factor analyzed a 30 item 6 point Likert scale and identified two dimensions that corresponded to Bandura’s (1977) efficacy expectations. A belief in “teaching efficacy” (i.e., that teachers can make a difference) corresponded with Bandura’s “outcome expectancy”, whereas, a belief in “personal teaching efficacy” (i.e., that they personally can effect change as teachers) corresponded with Bandura’s “self-efficacy.” The results were also compatible with Ashton and Webb’s (1986) two dimensional model of teaching self-efficacy.

Ashton and Webb (1986), in their book, Making a Difference: Teachers’ Sense of Efficacy and Student Achievement, neatly summarize Bandura’s theory as it applies to teachers:

According to Bandura, self-efficacy is a cognitive mechanism that regulates behaviour. A sense of self-efficacy develops as an individual acquires a conviction of personal competence; that is, when the individual believes he or she has mastered the behaviours
necessary to achieve a desired outcome. The strength of an individual’s sense of self-efficacy determines whether he or she will initiate and sustain a behaviour in the face of difficulty. Thus, the individual’s expectations of personal efficacy influence future learning and motivation. Contrary to behaviourist assumptions, Bandura contends that behaviour is controlled by the individual’s personal efficacy beliefs rather than by the presence of reinforcing consequences (p. 8).

Acknowledging the importance of efficacy beliefs on behaviour, it is possible that a TEP could be detrimental to a teachers’ sense of self-efficacy by emphasizing shortcomings. Given that many residents have not given much thought to teaching, they may be overwhelmed by “all there is to know” and how “few skills they actually possess.” A TEP focusing on developing teaching self-efficacy also needs to include opportunities to cultivate personal mastery experiences.

Questions to be Answered

1. What attitude do general internal medicine residents have towards teaching (i.e., self-efficacy, beliefs about teaching, and interest in teaching)?
2. What is the effect of a CTU rotation and associated teaching responsibilities on residents' sense of teaching self-efficacy, self-reported teaching behaviours, beliefs about teaching, and interest in teaching?

3. What is the impact of a TEP on residents' sense of teaching self-efficacy, self-reported teaching behaviours, beliefs about teaching, and interest in teaching?

4. Is a change in self-efficacy (i.e., attitude subconstruct) associated with a change in self-reported teaching behaviours?

Definition of Terms

andragogy (andragogical perspective of adult education): "the art and science of helping adults learn, in contrast to pedagogy as the art and science of teaching children" (Knowles, 1980, p. 43). Andragogy is based on four assumptions about how adults differ from children: (1) their self-concept moves from one of being a dependent personality toward being a self-directed human being; (2) they accumulate a growing reservoir of experience that becomes an increasingly rich resource for learning; (3) their readiness to learn becomes oriented increasingly to the developmental
tasks of their social roles; and (4) their time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly, their orientation toward learning shifts from one of subject-centredness to one of performance centredness.

attending (attending physician): faculty member in charge of patient care and responsible for supervision and teaching of residents, interns, and medical students providing patient care.

attitude: used broadly to describe all objectives that have to do with affect, feelings, values, and beliefs.

bedside teaching: teaching that occurs at the patient’s bedside. Usually related to physical examination or other diagnostic and patient management issues.

Clinical Teaching Unit (CTU): the “location” (may or may not be physically separated from the rest of the hospital, i.e. a separate ward) where housestaff (i.e., residents, interns, and medical students) admit and take care of patients under the supervision of an attending physician (i.e., faculty).
clinical teaching: medical education is generally divided into basic science (i.e., pre-clinical) and clinical teaching. Clinical teaching can occur in the classroom (e.g., undergraduate cardiology) or in the hospital.

constructivist perspective of adult education (constructivism): from the constructivist perspective, learning is viewed as a qualitative transformation of understanding rather than a quantitative accretion, and learners are seen as active constructors and "makers of meaning" (Candy, 1991). The constructed system of personal meanings becomes the learners' guide for behaving. Thus, constructivism in education is concerned with two things: how learners construe (or interpret) events and ideas, and how they construct (build or assemble) structures of meaning. The constant dialectical interplay between construing and constructing is at the heart of a constructivist approach to education..." (Candy, 1991, p. 272).

CTU rotation: medical training is divided into "blocks" of time in specific specialties - rotations. The CTU (clinical teaching unit) rotation refers to the general internal medicine rotation.

CTU: see Clinical Teaching Unit
general internal medicine: the branch of medicine having to do with the non-surgical (i.e., "medical") care of adults.

housestaff: residents, interns, and senior medical students working in the hospital and responsible for patient care.

intern: individual in their first year of post graduate training (i.e., PGY 1)

internal medicine: the branch of medicine having to do with the non-surgical (i.e., "medical") care of adults. The specialty of internal medicine can be divided into subspecialties including general internal medicine, cardiology, etc.

MSL (medical student intern): final year medical student. Often referred to as clinical clerks.

PGY (post-graduate year): level of postgraduate training for residents. For instance, PGY 2 would be a second year resident.

resident: individual involved in postgraduate medical training.

rotation: medical training is divided into "blocks" of time in
specific specialties - rotations.

**rounds**; one of the most overused words in medical education with different meanings in different contexts. Overall, it means the gathering of a group of physicians or housestaff for the purpose of teaching or other patient care related activities. Examples include teaching rounds, work rounds (see below), etc.

**self-efficacy**: "According to Bandura, self-efficacy is a cognitive mechanism that regulates behaviour. A sense of self-efficacy develops as an individual acquires a conviction of personal competence; that is, when the individual believes he or she has mastered the behaviours necessary to achieve a desired outcome. The strength of an individual's sense of self-efficacy determines whether he or she will initiate and sustain a behaviour in the face of difficulty. Thus, the individual's expectations of personal efficacy influence future learning and motivation. Contrary to behaviourist assumptions, Bandura contends that behaviour is controlled by the individual's personal efficacy beliefs, rather than by the presence of reinforcing consequences (Ashton & Webb, 1986, p. 8).

**social / situated perspective of adult education**: this perspective of adult education focuses on the relationship
between learning and the social situation in which it occurs. Lave and Wenger (1991) view situated learning as an intermediary between learning as an individual cognitive process and learning as a characteristic of social practice. In their view, "learning is not merely situated in practice - as if it were some independently reifiable process that just happened to be located somewhere; learning is an integral part of generative social practice in the lived-in-world" (p. 35).

**teaching attitude**: the operational definition of this construct for the purpose of this study included: information about teaching self-efficacy (i.e., teaching attitude subconstruct), beliefs about teaching, and interest in teaching.

**teaching self-efficacy**: "the extent to which teachers believe that they have the capacity to affect student performance" (Ashton, 1984, p. 28). See also self-efficacy.

**TEP**: Teacher Education Program

**TE**: Teaching Efficacy

**TSE**: Teaching Self-Efficacy

**work rounds**: usually refers to housestaff going around as a
group, under the leadership of the resident, for the primary purpose of taking care of patients (as opposed to teaching as the primary purpose).

Overview of the Study

The balance of this thesis is organized in four chapters. Chapter two reviews the relevant theoretical and empirical literature. It begins with an overview of research on clinical teaching in medical schools. Next, theoretical perspectives pertinent to the development, implementation, and evaluation of a resident TEP are presented, specifically, andragogy, a constructivist perspective of education, the role of reflection, and self-efficacy will be addressed. Finally, empirical research on resident TEPs will be considered.

Chapter three describes the research methodology. This includes a description of the research design and sampling method. The development and piloting of the self-efficacy/attitude/self-reported behaviour instrument will be described in detail. Finally, data collection and analysis issues will be addressed.

Chapter four reports the impact of the TEP on residents' sense of teaching self-efficacy, self-reported teaching behaviours,
beliefs about teaching, and interest in teaching as compared to controls.

Finally, chapter five will discuss the results and address the research questions posed in chapter one. The theoretical and practical implications of the results will be discussed and suggestions for further research will be proposed.
CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

This chapter begins with a brief review of the literature on clinical teaching in medical school. The predominant portion of this chapter is divided into two sections: "Theoretical Perspectives Pertinent to Resident TEPs," and "Empirical Perspectives Pertinent to Resident TEPs." The theoretical section is mainly concerned with perspectives of adult education. The andragogical perspective is reviewed briefly before undertaking a more elaborate review of constructivism. The role of reflection in learning will be gone over in some detail including a brief survey of the transformative perspective of adult education. The theoretical section concludes with the social / situated perspective of adult education. A brief overview of the perspective is undertaken before discussing cognitive apprenticeship. Considerable emphasis will be placed on self-efficacy, as part of Bandura's (1986) social cognitive theory, and teaching efficacy.

The section on Empirical Perspectives Pertinent to Resident TEPs begins with a short introduction on improving teaching. Several studies on resident teaching will be reviewed before
going on to a detailed analysis and critique of existing research on resident TEPs.

Research on Clinical Teaching in Medical Schools

The first significant formal effort to investigate the process of teaching in medical schools was the "Project in Medical Education" at the University of Buffalo in the late 1950's (Miller, 1956). The author, with the help of professional educators, investigated the practices and problems associated with medical "pedagogy." He commented on the lack of reliable information on the practices and attitude of medical teachers.

Jason (1962) soon followed with an exploratory study of "what" medical teachers were doing (as opposed to "how well" they did it, or "what effect" it had on the students). He examined the characteristics of the teacher (e.g., age, rank, etc.), the type of medical school (e.g., private/state, university affiliated/non-affiliated, part-time/full-time faculty, etc.), and the teaching setting (e.g., lecture, tutorial, ward rounds, etc.) with respect to the observed frequency of seven teaching behaviours: (1) attitude to difference; (2) sensitivity to physical setting; (3) attitude to students; (4) use of
instructional materials; (5) reaction to students' needs; (6) use of teaching methods (e.g., lecture, discussion, etc.); and (7) use of challenge. In another observational study, Reichsman, Browning, & Hinshaw (1964) noted the frequency of certain teaching behaviours: e.g., Was the patient seen as part of the case presentation?; Did the staff member directly observe any part of the history or physical examination?; Was a correlation between basic science and clinical medicine made?; etc.. The authors reported that "many (staff members) seem to have two central difficulties: (a) in focusing, on the spur of the moment, on the more relevant, and (b) in making explicit, without premeditation, what they want to communicate" (p. 160). Like other studies of this early period (e.g., (Adams, Ham, Mawardi, Scali, & Weisman, 1964)), the authors describe, rather than evaluate, the process of medical education.

Studies then began to focus on the refinement of observational instruments and started to look at correlations. Stritter, Hain, & Grimes (1975) developed an instrument to survey medical students regarding effective teaching behaviours. Expanding on general educational research, Irby (1978) helped to establish the important dimensions of a clinical teacher. He remarked that the usual standardized classroom rating forms were not applicable to clinical teaching "because of the unique aspect of clinical instruction" (p. 808). An analysis of student
responses to the characteristics of the "best and worst" clinical
teachers, revealed six independent factors (i.e., dimensions):
(1) organization/clarity; (2) group instructional skills; (3)
enthusiasm/stimulation; (4) knowledge and analytic ability;
(5) clinical supervision; and (6) clinical competence. In a
subsequent study, Irby and Rakestraw (1981) validated the
instrument by assessing each dimension on a 5 point scale.
They found high overall inter-rater reliability. Overall
teaching effectiveness correlated most strongly with
enthusiastic and stimulating (0.80), establishes rapport (0.77),
actively involves student (0.76), and provides direction and
feedback (0.75). In a review of both the medical and non-
medical literature, Rippey (1981) describes a similar 6
dimension instrument: (1) subject matter expertise; (2)
pedagogic skill; (3) charisma-stimulation-popularity-civility;
(4) empathy; (5) effort seriousness; and (6) judgement.

Bad clinical instructors are often thought to be those that lack
some of the dimensions above. However, acts of commission
may also render a teacher ineffective. Napell (1976)
describes 6 common "non-facilitating" teaching behaviours:
(1) insufficient "wait time;" (2) the rapid reward; (3) the
programmed answer; (4) nonspecific feedback questions; (5)
fixation at a low level of questioning; and (6) the teacher's ego
stroking and classroom climate. This last behaviour sounds
similar to what Brancati (1989) calls “the art of pimping.”
Pimping questions are political rather than educational in nature. These difficult (usually obscure) questions are asked to boost the attending's self-esteem and to maintain the team hierarchy.

More recently, the emphasis has shifted to faculty development and the usefulness of workshops and other methods for improving teaching skills (e.g., Adams, Ham, Mawardi, Scali, & Weisman, 1974; Bazuin & Yonke, 1978; Cassie, Collins, & Daggett, 1977; Patridge, Harris, & Petzel, 1980; Sheets & Henry, 1984; Skeff, Campbell, Stratos, Jones, & Cooke, 1984). Investigators have also become more interested in the actual dynamics of the teacher/student interaction.
Foley, Smilansky, & Yonke (1976) studied the nature and the cognitive level of the verbal interaction between medical students and teachers. Their data suggests that teachers were less than effective at helping students develop problem solving skills. For the most part, students were passive and received low level factual information.

Investigators have started correlating process (teacher interaction) and product (learner outcomes) (e.g., Petzel, Harris, & Masler, 1982). They have also examined the effectiveness of the seminar method (for improving clinical
teaching) on the process/product relationship (Skeff, Campbell, & Stratos, 1985).

Like most areas of inquiry, the results of early studies have raised more questions than they have answered.

Theoretical Perspectives Pertinent to Resident TEPs

Introduction

Before discussing the existing literature on resident TEPs, a review of the adult education literature pertinent to designing and implementing such a program, will be reviewed. One of the major problems with those programs described is that few have made explicit the epistemological beliefs that informed their programs. Androgogy, constructivism, reflection, self-efficacy, and the social situated perspective of adult education will be reviewed as they pertain to a resident TEP.

Andragogical Perspective

Knowles (1973) credits his introduction to the concept (and label) of andragogy to the Yugoslavian adult educator, Dusan Savicevic, in 1967. Knowles introduced the concept and label
into the American education literature in 1968 with his paper, "Androgogy [sic] Not Pedagogy," in Adult Leadership. As the title of his paper implies, Knowles suggests that adults are somehow different than children when it comes to teaching and learning, and this is the essential assumption underlying andragogy. Originally, he defined "andragogy as the art and science of helping adults learn, in contrast to pedagogy as the art and science of teaching children" (italics mine) (Knowles, 1980, p. 43). In response to criticism and challenges from educators who argued that andragogy also applied to children, Knowles now sees andragogy as another set of assumptions about learners in contrast to the assumptions of pedagogy. He sees both models occupying the ends of a spectrum.

Andragogy is based on four assumptions about how adults differ from children: (1) their self-concept moves from one of being a dependent personality toward being a self-directed human being; (2) they accumulate a growing reservoir of experience that becomes an increasingly rich resource for learning; (3) their readiness to learn becomes oriented increasingly to the developmental tasks of their social roles; and (4) their time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly, their orientation toward learning shifts from one of subject-centredness to one of performance centredness.
These four assumptions have considerable implications for practice (Knowles, 1973; Knowles, 1978; Knowles, 1980). The learning climate takes on particular significance from an andragogical perspective; the physical, and more importantly the psychological environment must be relaxed and conducive to risk taking. Preservation of self-esteem and self-concept often take precedence over learning when learners fear ridicule. It also becomes important that learners feel respected by the teacher. Adult learners are most motivated to learn those things they feel a need to know; self-diagnosis of learning needs, therefore, becomes an important part of the learning process. It also follows that learners are more likely to "buy-in" when they are involved in the planning process. From an andragogical perspective, learning should take precedence over teaching given that one cannot be forced to learn. The teachers' role, thus, becomes one of facilitating learning rather than teaching. Andragogy places considerable emphasis on prior experience as a rich and important resource in the learning process. Adults' self-concept is often intimately tied to their life experience. Experiential learning with an emphasis on practical application is emphasized. The content should be problem-centred or performance-centred rather than subject-centred and should focus on the
immediate interests and concerns of the learners.

Knowles theory of adult education has remained popular over the years despite its flaws. Perhaps its persistance has to do with its seductive intuitive logic, and the fact that it is consistent with the beliefs of many adult educators. Possibly its most serious flaw has to do with the fact that it is a theory of learning that purports to be in contradistinction to how children are taught (see my italics of Knowles quotation in the first paragraph). One must make a leap of faith to assume that how children are taught accurately reflects how they learn, and more importantly how they learn best. Many of the criticisms of Knowles theory tackle his assumptions of how adults differ from children (e.g., Tennant, 1986). Knowles himself, tries to remedy the situation by changing his definition of andragogy to one that includes children (Knowles, 1980) (see above). Despite this disclaimer, his work is replete with discussions of how adults differ. Hartree (1984) criticizes attempts at presenting a unified theory of adult education. "The most notorious (of which) is probably Malcolm Knowles' theory of andragogy" (p. 203). She questions whether it is a theory of learning or teaching, and even its status as a theory at all. She regards Knowles work more as a philosophical position rather than a descriptive theory. Several other criticisms of Knowles theory, and
assumptions underlying andragogy, exist but are beyond the scope of this dissertation. Despite its flaws, Knowles work offers many practical insights into the planning and conduction of adult education.

Constructivism

Introduction

The concept of constructivism is somewhat difficult to grasp. The difficulty may be due, in part, to the paradigm shift and rethinking of tacit assumptions required to fully understand constructivism. Assumptions about the nature of reality, truth and knowledge, and the implications these assumptions have on what it means to “know,” to “learn,” and to “teach.” The shift in thinking required to understand constructivism can be likened to the historical paradigm shifts described by Kuhn (1962) in his book, The Structure of Scientific Revolutions. Progress in science (or education) does not always follow an incremental linear increase in understanding and knowledge. At some point, existing models are no longer helpful; we have “hit a wall.” If progress is to occur, a major rethinking of the (often tacit) assumptions must be undertaken: what is required is a shift in paradigm. Constructivism represents one
such paradigm shift. A new way of looking at reality, truth, knowing, learning, and teaching (among other things).

A second difficulty with understanding constructivism lies in the varied applications of the concept. Constructivism is more than an educational perspective or epistemology. It has beginnings and connections with such diverse areas as philosophy, sociology, literature, and anthropology (Candy, 1987). It is beyond the scope of this dissertation to review the origins and development of constructivism across disciplines. However, the principles of constructivism will be reviewed from an educational perspective, more specifically, its implications for the development of a resident TEP. Candy (1987) reminds us that constructivism "is not a single monolithic theory, but rather a cluster of perspectives united by underlying similarities in world view" (p. 297). A heterogeneous group of educational theories can be gathered under the rubric "constructivism." Furthermore, constructivism serves as a foundation for a number of other educational perspectives (e.g., situated/social, feminist, transformative), some of which will be discussed in more detail later in this chapter.

The major tenets of constructivism have to do with how individuals come to "know" the world (and things about it).
Although constructivists acknowledge the existence of an external reality, individuals are not seen as simply observing or experiencing an objective reality. Rather, by interacting with the world, individuals construct representations of reality. These representations (or constructions) allow them to interpret (or construe) events or ideas. The acts of constructing and construing are iterative with no definitive end point. When prior constructions are used to construe new events or ideas, these new ideas may become incorporated into a new and elaborated construction. Therefore, individuals are continually trying to make sense (or "make meaning") of events and ideas. In fact, from a constructivist perspective, meaning is imposed by the individual rather than being objectively discovered (or residing in the event or idea). This implies that each individual is actively involved in making meaning and that each individuals' representation of the world is personal and idiosyncratic. Duffy and Jonassen remind us that "(there) are many ways to structure the world and there are many meanings or perspectives for any event or concept. Thus, there is not a correct meaning that we are striving for" (1991, p. 8).

Individuals, as viewed from a constructivist perspective, are not as lonely and isolated as they might appear at first glance. The process of negotiation between individuals allows them to
come to a common understanding of certain situations (i.e., social constructions). Although, individuals’ constructions are not identical, they are close enough for communication and a common understanding. In fact, the constraints on individual constructions are largely imposed by the community of which the individual is a member (Cognition and Technology Group at Vanderbilt, 1991).

A constructivist perspective has profound implications for the nature of truth and knowledge. It is at odds with the view that knowledge is an identifiable entity with some truth value. Instead, it is believed that sufficient degrees of freedom exist in the structure of the physical and epistemological worlds to allow the construction of alternative personal theories about the environment, and of what it means to “know” (Cognition and Technology Group at Vanderbilt, 1991). Knowledge, therefore, is not a reduplication of the “real world,” but is a representational map or model. Several maps (or models) are possible, but each one is not equally valid, as some maps will necessarily fit more closely. Candy (1991), in a review of constructivism, reports that the various constructivist disciplines “have all emphasized how people invent, organize and impose structures on their experiences, and have argued that knowledge is thus a social artifact” (p. 253).
Learning

To adopt a constructivist perspective, one must accept that knowledge cannot be taught or transferred intact. The learner must actively construct a system of personal meanings with which to construe further events or ideas. It is only through the dualistic acts of constructing and construing that the individual comes to "know" (and understand). It follows that each system of personal constructs must necessarily be idiosyncratic. "Thus, constructivism in education is concerned with two things: how learners construe (or interpret) events and ideas, and how they construct (build or assemble) structures of meaning. The constant dialectical interplay between construing and constructing is at the heart of a constructivist approach to education, whether it be listening to a lecture, undertaking a laboratory session, attending a workshop, reading a text, or any other learning activity" (Candy, 1991).

Ramsden (1988a), in his book, Improving Learning: New Perspectives, expresses discontent that even the brightest students are unable to demonstrate that they understand what they have learned, despite the fact that they are able to recall large amounts of factual information on demand, have amassed huge quantities of detailed knowledge, and can pass
exams successfully. He argues that these students have in fact NOT learned at all. He maintains that if we are to improve learning (and teaching), we must come to a different understanding of what it means to learn.

Learning “means a movement towards being able to solve unfamiliar problems, ...recognizing the power and elegance of concepts in a subject area, and ...being able to apply what has been learned in class to problems outside class. It means a realization that ‘academic’ learning is useful for interpreting the world we live in. It means having changed one’s understanding” (p. 15).

Ramsden’s view is in keeping with the constructivist perspective that learning represents a qualitative change in the learner. Marton and Ramsden (1988) advance the fundamental principle that “learning should be seen as a qualitative change in a person’s way of seeing, experiencing, understanding, conceptualizing, something in the real world - rather than as a quantitative change in the amount of knowledge someone possesses” (italics mine) (p 271).

Perhaps an easier way to depict the qualitative change that leads to a new way of understanding, is to conceive of learning
as a change from "thinking like a" lay person to "thinking like a...". To draw an example relevant to this dissertation, let us consider teacher education. Rather than seeing the process of teacher education as one of the acquisition (or accumulation) of knowledge, skills, and attitude (i.e., quantitative change), constructivist would argue for having the learner think like a teacher (i.e., qualitative change). In the latter, learning involves the construction of a personal map (or model) for thinking like a teacher. At first, this map will necessarily be imperfect (in fact, it can never be perfect), but with experience and interaction (i.e., negotiation) with "coaches," student teachers can refine the "fit" of their map. In the process, they increasingly come to think like a teacher; they start to share common meaning for events (i.e., social constructions of the "society" of teachers). This common meaning (i.e., construction) does not deny that all maps are still personal or idiosyncratic. It simply indicates that teachers, as a group, have maps with a close enough fit to each others, to come to some common understanding of situations. Saljo (1988) talks about learning as acquiring "provinces of meaning."

Implicit in this qualitative change in the learner, is an appreciation for the starting point of the learner (i.e., current concepts or models). In a sense, the student is "remapping" their knowledge base. Old ideas and concepts are not
abandoned. New connections between old concepts occurs (and new knowledge); misconceptions must be confronted; alternative and more useful, concepts must be constructed. According to White and Gunstone (1992) "the person's understanding develops as new elements are acquired and linked with the existing pattern of associations between elements of knowledge. Addition of new elements will often stimulate reorganization of the pattern as the person reflects on the new knowledge and sees how it puts the older knowledge in a different light" (italics mine) (p. 13). Recalling a constructivist's view of reality, it follows that "whatever the 'objective' reality, learners respond to events 'as though' they were true." This means that learning often proceeds from a series of personal propositions which, if not disproved, are assimilated into explanatory schema 'as though' they were demonstrably true. After a while, they become so thoroughly internalized that, to all intents and purposes, they are true for the individual" (Candy, 1987, p. 312-313).

Except for a brief mention of teacher education, the above discussion of constructivism has yet to mention the content and context of learning. This is by no means to describe constructivism simply as a process or to imply that the process of constructivism can be played out devoid of content or context. On the contrary, the idea of content (the "what") and
process (the “how”) as interlinked and inseparable parts of learning is central to a constructivist epistemology (Marton & Ramsden, 1988). Learning, obviously, cannot occur without content (i.e., something to learn), and learning cannot occur without an act of learning (i.e., process). Marton and Ramsden (1988) advocate that “learning and thinking skills are not separate entities that have a life of their own.... We should teach specific knowledge domains in such a way that a student’s general capacity is developed at the same time; we should not teach ‘metacognitive skills’ but should encourage students to reflect on learning in specific content domains” (italics mine) (p. 274). The importance of content, and more specifically context, will be addressed in greater detail with the discussion of a subsection of constructivism, situated learning, later in this chapter.

Teaching

A shift in assumptions about what it means to “know” and to “learn” necessitates an analogous shift in the meaning of teaching. From a constructivist perspective “teaching will focus on what can be changed in the learner’s understanding” (Ramsden, 1988b, p. 21). Contrary to conventional wisdom, teaching is not the transmission of knowledge intact to
learners, but involves the negotiation of meaning allowing the student to construct a system of personally relevant meanings. The word "negotiation" in this context is apt to cause some confusion and deserves elaboration. Negotiation does not mean "meeting the student half way," nor does it mean necessarily accepting students’ preconceptions (or misconceptions) as valid. Negotiation describes a process of checks and balances involving exchange and dialogue between the student and teacher, at the end of which the teacher is satisfied that the student's conception is appropriate - i.e., that understanding has occurred. Therefore, teaching becomes a very intersubjective process. This is in direct contradistinction to the more common practice of teaching in which students are the object of teachers’ instruction (i.e., subject-object process). Therefore, from a constructivist perspective, good teaching is primarily concerned with learning.

In his book, Improving Learning: New Perspectives, Ramsden (1988a) proposes a relational view of teaching, several aspects of which are elaborated by himself and other authors throughout the book and include: (1) learning is about change in conception, (2) learning always has content as well as a process, (3) improving learning is about relations between learners and subject matter, not teaching methods and student
characteristics, (4) improving learning is about understanding the student's perspective, and (5) educational research and teaching are more closely related than people sometimes believe.

A brief overview of "phenomenography" (Marton, 1981, cited in Saljo 1988) may clarify the five aspects of the relational view of teaching as proposed by Ramsden. Phenomenography is a qualitative research method that explicitly deals with discovering and analyzing peoples constructions in an educational setting. Participant observation, interviews, and the analysis of written documents are typically used to generate data. Analysis of the data allows the "mapping" of individuals' constructions and conceptions. Although constructions are idiosyncratic, they tend to cluster in to categories. Researchers attempt to generate a "picture" of the variations in conceptions (i.e., constructions) held by a group of individuals. For instance, a researcher may discover that high school students' understanding of gravity fall into a certain number of categories. The researcher may also discover that some of these are based on common misconceptions.

Understanding students' conceptions (or misconceptions) is the best starting point for teaching from a constructivist
perspective. This fittingly demonstrates the relationship of teaching and educational research. "Teaching is an activity that assumes an understanding of learning. To teach in a way that encourages changes in conceptions, instructors must recognize how students already think about phenomena - they must make themselves aware of, and use, the conceptions students already have" (Ramsden, 1988b, p. 13). Therefore, teaching involves two basic steps: probing understanding in order to map students' thinking, and helping students develop new (or more appropriate) conceptions. This approach has important implications for students' wrong answers. Students' wrong answers to teachers' questions are a window to students' misconceptions. It becomes more important to discover the faulty reasoning that led to a student's wrong answer than to replace the wrong answer with the correct one. By investigating wrong answers teachers can map out deficiencies, inconsistencies, and misconceptions. Similarly, it is important for teachers to probe for supporting evidence of students' correct answers. Teachers may be surprised how often students get "the right answer for the wrong reason" or that students are simply parroting answers with no clear understanding. White and Gunstone (1992) indicate that questions beginning with "Why...", "How...." and "What if..." are more likely to probe understanding, whereas, questions beginning with "What...", "Who...", "Where..." and "When..."
are more likely to test recall.

Marton and Ramsden (1988) suggest several teaching strategies for conceptual change learning: (1) make the learners' conceptions explicit to them, (2) focus on a few critical issues and show how they relate, (3) highlight the inconsistencies within and the consequences of learners' conceptions, (4) create situations where learners centre attention on relevant aspects, (5) present the learners with new ways of seeing, (6) integrate the "knowing what" and "knowing how" of a subject, (7) test understanding of phenomena; use the results for diagnostic assessment and curriculum design, and (8) use reflective teaching strategies (italics mine).

Factors Influencing Learning

The nature of the teaching and learning process from a constructivist perspective can be threatening to students. Probing students' understanding and challenging them to confront misconceptions cannot occur in a rigid authoritarian atmosphere. The learning climate must be conducive to risk taking, otherwise, little learning will occur.
Providing a safe atmosphere is only the first step towards helping students build alternative conceptions. Experience is also key to the process. Teachers should arrange situations that allow students to confront their misconceptions and lead them to more appropriate (and desirable) ways of understanding phenomena. “Students need experiences that allow them to see that their conception is inappropriate, which is far more powerful than telling them it is wrong” (Marton & Ramsden, 1988, p. 271). Constructivists emphasize the inseparability of content, process and context; they also acknowledge the importance of experience in helping students develop new constructs. Nevertheless, context and experience (i.e., situations) do not play a central role from a constructivist perspective. The important roles of context and experience will be reviewed in more detail in the discussion of the social / situated perspective of adult education later in this chapter.

Experience in a safe atmosphere is unlikely to promote learning if it occurs at a hurried, breathless pace. There is a tendency in contemporary educational practice to “cover” more material when students are unfamiliar with a subject area. “Paradoxically, providing a structure built on a solid foundation of a few main issues, at the expense of covering detail, leads to students remembering more details in the end” (Marton and Ramsden, p. 277, 1988). If teachers want their
students to understand more, they will have to cover less. Time, therefore, is another important factor in learning. Students need time to engage in discussion with the teacher and other students. They need time to think and reflect.

Constructivists emphasize the important role of students' prior knowledge in the teaching-learning moment. Ramsden (1988) reminds us that "students rarely have no knowledge about a topic, or no strategy when they tackle a problem" (p. 22). Prior knowledge serves as an advanced organizer, or as a way of construing new phenomena. Some teachers take great advantage (often unknowingly) of students' prior knowledge through the use of analogies. Relating abstract concepts to real world examples is another way of taking advantage of students' prior knowledge. The quality and quantity of a students' prior knowledge offers an explanation to the paradox discussed above: the less students understand about a subject area, the less they can be expected to learn. The flip side of this argument is that the more students already know, the more advanced organizers they have: i.e., places to "attach" new concepts. Some have argued that prior knowledge is the most important determinant of new learning (Schmidt, De Grave, De Volder, Moust, & Patel, 1989).

The above discussion on factors that influence learning has
centred on ways that educators can enhance learning. Although it is beyond the scope of this dissertation to address the many potential negative influences on learning, one key factor deserves mention: evaluation. Evaluation can facetiously be likened to the “tail that wags the dog”: evaluation drives the system. Ramsden (1988) argues that “perhaps the most significant single influence on students’ learning is their perception of assessment. It is in the assessment process that the greatest opportunity arises for students’ perceptions of the educational context and their understanding of concepts to diverge” (p. 24). Throughout a course, the thought of the evaluation method hangs around students’ necks. It is important to note that it is the perception of the evaluation method, and not the method itself, that drives the system. The effect is not only in terms of effort expended, but in the choice of study techniques, resource material, etc.

The above discussion is by no means an exhaustive review of factors (positive and negative) that influence learning. It is meant to acknowledge the existence of such factors, and to highlight a few key players: learning climate, context/situation, time/reflection, prior knowledge, and evaluation. Learning climate was an important factor in the prior discussion of the andragogical perspective. Context and
situation will be the main focus in the next section: Social/Situated Perspective of Adult Education. Time and reflection will be addressed further in the discussion of the role of reflection in learning.

Limitations of a Constructivist Perspective

It is beyond the scope of this dissertation to provide an indepth critique of the constructivist perspective of adult education. However, criticism grouped into three broad categories will be considered briefly: high demands of the learner, subjectivity of the perspective, and the difficulty of evaluation.

Perkins (1992) discusses the high demands constructivism imposes on the learner. First, he discusses the cognitive demands. He focuses not only on the cognitive demands of active participation and construction of new concepts by learners, but also on the “conflict faced” path of constructivist learning. By “conflict face,” he is referring to the cognitive demands imposed by the conflict of continually challenging students’ preconceptions and misconceptions in an attempt to replace them with more appropriate alternative conceptions. Next, he focuses on the cognitive demands of placing students
in the role of "task managers," in an attempt to have students become autonomous thinkers. He argues that students may not be ready to take on task management responsibilities, especially given the already high cognitive demands imposed (see above). Lastly, Perkins worries about students not "buying in" to the constructivist agenda, and thereby, not becoming fully engaged in the learning process.

Another criticism levied against constructivism is its inherent subjectivity e.g., (Molenda, 1991). What is often neglected is that constructivism fits along a spectrum of subjectivity. For the purpose of this dissertation, a more moderate view of constructivism is adopted. As mentioned earlier, constructivists don't deny the existence of an external reality. Their assumptions are about how individuals come to know (or represent) and interpret reality. Also, an openness to alternative conceptions does not deny that some models are more appropriate. In fact, the idea behind much of constructivist education is having students adopt models consistent with a particular group (e.g., "think like a doctor, or teacher...").

Finally, there is the problem with evaluation from a constructivist perspective e.g., (Cunningham, 1991). No attempt will be made to do anything but lift the lid of this
Pandora's box, as evaluation continues to be one of the most hotly debated criticisms of constructivism. Issues around goals and objectives, quantity vs. quality, appropriate methods, and who is best able to judge that learning has occurred, only scratch the surface. The issue of evaluation "driving" the system was also discussed briefly above. The views of the author with respect to grounding a resident TEP in a constructivist perspective of adult education and the ensuing implications for evaluation will unfold throughout the remainder of this dissertation. Evaluation within the context of the resident TEP was structured with the following features in mind: (1) given the voluntary nature of the program and the perception by the residents that it "didn't count" towards their final evaluation, the method of evaluation should not drive the system, and (2) the broad goals of the program allows for qualitatively and quantitatively different learning outcomes for different residents; the main focus is on facilitating residents achievement of personal goals and objectives.

Conclusions

A brief quote from Marton and Ramsden (1988) helps summarize the main features of a constructivist perspective of
education:

From (the) principle of learning as a change in conceptions flow the themes and injunctions that should by now be familiar: a view of content and process in learning as parts of the same whole, an emphasis on students' conceptions and perceptions, and learning about students' thinking as the key that will unlock the door to better teaching and course design. If we want to change students' understanding, we have to deal with their present understanding in a methodical way. Not only can this kind of learning not be dealt with solely in general terms; it also cannot be value-free. We have to know what view of a particular phenomenon we would like a learner to develop (p. 272).

**Reflection**

As mentioned, constructivism is not a single theory, rather it is a group of perspectives grounded on many of the same assumptions. Given that constructivism may be at the root of other educational perspectives, it sometimes becomes difficult to tease out specific elements of clear-cut perspectives. The desire for order and simplicity may drive some authors (or readers) to pigeon hole examples into rigid categories.
Perhaps it is more appropriate to think of analyzing examples from a particular perspective rather than trying to label them outright. Donald A. Schon, in his book, *Educating the Reflective Practitioner* (1987) proposes a model for teaching "artistry" in the professions. Both the constructivist and situated/social perspectives apply. However, Schon's model will be reviewed from a constructivist perspective in the hopes of illustrating not only the practical application of constructivism to a resident TEP, but also its value.

Before discussing Schon's (1987) *Educating the Reflective Practitioner*, a brief discussion of "reflection" is in order. Given that constructivism locates learning within the individual, metacognitive skills must play an important role in learning. "Metacognition refers to the voluntary, conscious, and self-monitoring act of thinking. It is the opposite of reflex thinking. Such words as pondering, deliberating, cogitating, or reflecting describe metacognition" (italics mine) (Barrows & Pickell, 1991, p. 25). "What do we usually imagine when we think of reflection?...From a human view we may imagine quietly, mulling over events in our mind or making sense of experiences we have had" (italics mine) (Boud, Keogh, & Walker, 1985c, p. 8). Boud, Keogh, and Walker (1985) remind us that "the activity of reflection is so familiar that, as teachers or trainers, we often overlook it in formal learning settings,"
and make assumptions about the fact that not only is it occurring, but it is occurring effectively” (p. 8). Duley (1981, cited in Boud, Keogh, & Walker, 1985), emphasizes that, “the skill of experiential learning in which people tend to be the most deficient is reflection” (p. 611).

In their book (Boud, Keogh, & Walker, 1985b), Reflection: Turning Experience into Learning, Boud, Keogh, and Walker admonish “the half digested (and half baked) practical work or work experience” that students are subjected to under the guise of professional education (p. 7). They pose (and try to answer) a number of questions in their book: What is it that turns experience into learning?; What specifically enables learners to gain the maximum benefit from the situations they find themselves in?; How can they apply their experiences in new contexts?; Why can some learners appear to benefit more than others? From the authors point of view, the answer is in the book title, Reflection: Turning Experience into Learning.

At first glance, the wording in the above paragraph gives the impression that Boud, Keogh, and Walker’s book is grounded in a social / situated perspective of adult education (e.g., “practical work,” “work experience,” “situations,” “apply their experience to new contexts”). Upon further reading, one discovers that there is considerable overlap among
perspectives with a strong emphasis on constructivism. An andragogical perspective e.g., (Knowles, 1980) is also evident by the authors’ primary concern for the learner: “The characteristics and aspirations of the learner are the most important factors in the learning process” (p. 21). They emphasize the importance of the learners’ past experiences and diverse backgrounds. They also stress the value of the learning climate.

The major grounding of Boud, Keogh, and Walker’s (1985) book in a social situated perspective is self-evident. The authors also discuss in detail the importance of feelings and attitude. Although there are no specific references to Bandura’s (1977) work on self-efficacy, the discussions on attitude and feelings are virtually indistinguishable from Bandura’s concept of self-efficacy within his social cognitive theory (Bandura, 1986). Boud and colleagues, like Bandura, emphasize the importance of “foster(ing) the development of confidence and a sense of self-worth that can lead (the learner) to pursue paths which previously may have been unavailable to (them)” (1985a, 22). Again, like Bandura, Boud, Keogh, and Walker see perception (or interpretation) of performance by the individual as a more important element than outside assessment (although neither deny the importance of validation by external influences). Successful
practice (or "mastery experiences," (Bandura, 1977) is at the centre of both models.

Multiple perspectives of adult education are compatible with Boud, Keogh, and Walker’s model of reflection. Learning in this model, however, is situated within the learner, and places great emphasis on the learner’s view. Therefore, one could argue that constructivism lies at the heart of the model. The authors highlight the importance of "experience in order to lead to new understandings and appreciations" (p. 19). According to the authors, reflection "links new knowledge with old" and "integrates learning into his or her existing framework" (p. 21). The authors remind us that reflection should apply to the constructions of the learners, not the teachers, because events and concepts are only meaningful from the perspective of the individual construing their meaning (italics mine).

Boud, Keogh, and Walker (1985) propose a three part model of experiential learning based on reflection. The three parts include (1) experience(s), (2) reflective process, and (3) outcomes. The reflective process itself has three major elements: returning to the experience, attending to feelings, and re-evaluation. The authors suggest that specific time be allocated for reflection after the experience. The outcomes of
the reflective process include clarification of issues, the development of new skills, problem resolution, the development of new cognitive maps, the development of new perspectives, and changes in behaviour.

According to Boud and colleagues (1985a), "action ends the reflective process for the time being. Action can obviously occur at any stage of the learning process and it may itself precipitate a new phase of reflective activity" (p. 35). To the author of this dissertation, this remains one of the major limitations of this model. The separation of action and reflection denies the importance of an ability to reflect during action. Boud, Keogh, and Walker's reflection model is compatible with what Schon (1987) describes as "reflection-on-action." Schon's model is more inclusive with the addition of "reflection-in-action" (i.e., reflection during action). Jarvis (1992), in his book, Paradoxes of Learning, informs us that "action is clearly associated with rational thought and reflective learning, for both during the action and after it, actors might begin to reflect on situations and learn from it" (italics mine) (p. 115).

According to Schon (1987) "there is a crisis of confidence in the professions and their schools, (that) is rooted in the prevailing epistemology of practice" (p. 12). He argues that
professional schools are increasingly less able to teach their students what they need to learn most. From Schon's perspective, this is due to the dominant epistemology of professional practice (i.e., technical rationality) and the hierarchy of knowledge in professional schools: basic science, applied science, and technical skills of day to day practice. Upon graduating, students are ill prepared to deal with problems of real world practice because most of these problems are "not in the book." Unfortunately, students have only learned to apply rigid rules and solutions to "technical problems." Students have not learned what they need most to be outstanding practitioners: dealing with the "indeterminate zones of practice" - ambiguity, uncertainty, and value conflict. Schon does not deny that outstanding practitioners exist. He does not believe however, that their excellence is borne from professional education. Outstanding practitioners are thought to have more "wisdom," "talent," "intuition," or "artistry." According to Schon, artistry represents a different and important kind of knowing that is not inherently mysterious and can be rigorous in its own way. He is not negating the importance of applied science and research based knowledge. These are critically important, but they are "bounded on several sides by artistry" (p. 13). Schon argues that "the student cannot be taught what he needs to know, but (that) he can be coached: "He has to see on his own behalf and in his
own way the relations between means and methods employed and results achieved" (p. 17). To this end, Schon proposes the "reflective practicum" - learning experiences designed to help students acquire the artistry needed to deal with the indeterminate zones of practice (i.e., ambiguity, uncertainty, and value conflict). He envisions "the gradual passage to convergence of meaning (being) mediated ... by a distinctive dialogue of student and coach..." (italics mine) (p. 20), with reflection playing a central role.

Schon begins by describing "knowing-in-action", a kind of tacit knowing that is independent of the ability for description. For example, knowing how to ride a bicycle is embedded in the action of riding and is difficult to describe. Schon would argue that the knowing is in the action. "Whatever language we may employ, however, our descriptions of "knowing-in-action" are always constructions. They are always attempts to put into explicit, symbolic form a kind of intelligence that begins by being tacit and spontaneous" (Schon's italics) (p. 25). He emphasizes the automatic nature of many of our cognitive and psychomotor skills. Once learned, "we can execute smooth sequences of activity, recognition, decision, and adjustment without having...to 'think about it.' Our spontaneous knowing gets us through the day" (p. 26).
When something unexpected interrupts the smooth process of knowing-in-action, or when a mismatch of an element to an overall pattern is recognized, "surprise" draws our attention to our knowing-in-action. Attention is drawn to the situation at hand. According to Schon, there are two possible courses of action. First, we could just "stop and think" - "reflection-on-action" - and then return to the task (which may be later). Alternatively, we could reflect in the midst of action - "reflection-in-action." The distinction between reflection-on-action and reflection-in-action is somewhat artificial. For instance, if one experiences surprise in the midst of action, pauses briefly to think, then returns to the task, is this reflection-on-action (because of the pause) or reflection-in-action (because the task was ongoing)? The model is, however, more helpful with clear cut examples. For instance, a teacher experiencing a discipline problem in the classroom may simply deal with the situation without "thinking about it" (i.e., knowing-in-action). On her way home that night, she may replay the day's event in her head in an attempt to make sense of it and perhaps devise alternative strategies for dealing with similar future situations (i.e., reflection-on-action). An alternative approach would have her specifically attend to the situation, reflect in the midst of action, and act based on her reflection(s). "What distinguishes reflection-in-action from other kinds of reflection is its immediate significance for
In reflection-in-action, the rethinking of some part of our knowing-in-action leads to on-the-spot experiment and further thinking that affects what we do - in the situation at hand and perhaps in others” (p. 29).

Some would suggest that reflection-in-action is no more than simple trial and error. “But the trials are not randomly related to one another; reflection on each trial and its results sets the stage for the next trial. Such a pattern of inquiry is better described as a sequence of "moments" in a process of reflection-in-action.” (p. 27).

What are the implications of Schon's call for a shift in the epistemology of professional practice? And how will this shift address the indeterminate zones of practice (i.e., artistry) - ambiguity, uncertainty, and value conflict? According to Schon, professionals share a body of knowledge called an “... 'appreciative system' - the set of values, preferences, and norms in terms of which they make sense of practice situations, formulate goals and directions for action, and determine what constitutes acceptable professional conduct” (italics mine) (p. 33). Therefore, this 'appreciative system' or world view is a social construct (or map) that professionals use to construe practice situations. Learners, by negotiating meaning with established professionals (i.e., coaches), make
the transition from “thinking like a” lay person to “thinking like a” professional.

“Underlying this view of the practitioner’s reflection-in-action is a constructionist view of reality with which the practitioner deals - a view that leads us to see the practitioner as constructing situations of his practice, not only in the exercise of professional artistry but also in all other modes of professional competence” (Schon’s italics) (p. 36). Therefore, by selective attention, naming, sensemaking, and boundary setting, professionals (and “learning professionals”) build and maintain a world matched to their professional knowledge and know how.

Schon does not deny that learning facts, rules and operations, and applying these to technical (or standard) problems is important to the learning professional. His reflection-in-action model is not incompatible with traditional views of learning in the professions, it simply adds a dimension more suited to dealing with “artistry.” “If we see professional knowing in terms of “thinking like a” manager, lawyer, or teacher, students will still learn relevant facts and operations but will also learn the forms of inquiry by which competent practitioners reason their way, in problematic instances, to clear connections between general knowledge and particular
cases” (p. 39). Therefore, depending on teachers' views of “thinking like a...”, they may emphasize the rules of inquiry or the reflection-in-action by which students can develop their own. Schon goes on to explain how making the coach’s own reflection-in-action “visible” to students can help students deal with the indeterminate zones of practice and professional artistry. “If we focus on the kinds of reflection-in-action through which practitioners sometimes make new sense of uncertain, unique or conflicted situations of practice, then we will assume neither that existing professional knowledge fits every case nor that every problem has a right answer. We will see students as having to learn a kind of reflection-in-action that goes beyond statable rules - not only by devising new methods of reasoning, as above, but also by constructing and testing new categories of understanding, strategies of action, and ways of framing problems” (p. 39).

Making the coach’s own reflection-in-action “visible” to students is also an important feature of the “cognitive apprenticeship” (Collins, Brown, & Holum, 1991). Although different terminology is used, the ideas are similar. The title of Collins, Brown, and Holum’s (1991) paper, “Cognitive Apprenticeship: Making Thinking Visible,” is self explanatory. Collins and colleagues also emphasize the role of reflection in learning. Cognitive apprenticeship will be discussed in more
detail as part of the social situated perspective below.

A recent and intriguing article (Tremmel, 1993) entitled, "Zen and the Art of Reflective Practice in Teacher Education," "explores the possibility of enriching reflective teaching and teacher education programs by transcending the limitations imposed by technical and analytic views of reflective practice through the incorporation of non-Western notions of reflection, particularly the Zen Buddhist tradition of ‘mindfulness’" (p. 434). The author proposes Schon’s concept of reflection-in-action as a broader approach to reflection, and relates this concept to Zen teachings. He suggests that relying on a narrow definition of reflection can lead to the failure of TEPs, and proposes “preparing the mind” (i.e., learning to pay attention) as the first step towards reflective teacher education.

In summary, Schon proposes a new epistemology of professional practice (including teacher education) based on a constructivist perspective. His reflection-in-action model, he believes, will address both the technical and artistry components of what it means to be a professional. "When practitioners respond to the intermediate zones of practice by holding a reflective conversation with the materials of their situations, they remake a part of their practice world and
thereby reveal the usually tacit processes of worldmaking that underlie all of their practice” (p. 36).

**Beyond Reflection - Transformative Perspective of Adult Education**

The last sentence of the above paragraph is loaded and meaningful: “by holding a reflective conversation with the materials of their situations, they remake a part of their practice world and thereby reveal the usually *tacit* processes of worldmaking that underlie all of their practice” (italics mine) (Schon, 1987, p. 36). Schon’s reflective model is a natural and appropriate starting point to discuss Mezirow’s e.g., (Mezirow, 1978; Mezirow, 1989; Mezirow, 1990a; Mezirow, 1990b; Mezirow, 1991) view of reflection and his transformative perspective of adult education.

Schon takes us from “knowing-in-action” to “reflection-on-action” and finally to “reflection-in-action.” Mezirow (1990) challenges us (both educators and students) to move reflection to a higher level of abstraction: “critical self-reflection.” To put this in a language similar to Schon’s, Mezirow challenges us to move to “reflection-on-presuppositions.” Critical self-reflection involves an understanding of problem framing (not
unlike that put forth by Schon (1987) and an understanding of perspective taking (i.e., tacit assumptions constituting a frame of reference for construing events and ideas). Mezirow and Schon use the word tacit differently, however, for Schon, tacit is simply a matter of what is unsaid, understood, or implied. Mezirow takes us one level deeper and would have us question the assumptions underlying what is unsaid, understood, or implied. Therefore, Schon would have us make explicit our meaning perspective, whereas, Mezirow would have us question the assumptions on which our meaning perspective is founded.

But critical self-reflection is also much more that this; it is the means whereby "transformation" occurs (Mezirow, 1990b). "Perspective transformation is the process of becoming critically aware of how and why our presuppositions have come to constrain the way we perceive, understand, and feel about our world; of reformulating these assumptions to permit a more inclusive, discriminating, permeable, and integrative perspective; and of making decisions or otherwise acting upon these new understandings" (p. 14).

Mezirow (1991) distinguishes between the transformation of "meaning schemes" from the transformation of "meaning perspectives." Meaning schemes are specific beliefs,
knowledge, value judgements, attitude, and emotional reactions. Meaning perspectives are more encompassing; they are "personal paradigms" or maps of the world. Meaning perspectives give rise to meaning schemes. Both meaning schemes and perspectives allow us to construe experiences.

According to Mezirow (1991), transformation of meaning schemes through reflection is a common occurrence; it allows for the correction of misinterpretation and does not necessarily involve critical self-reflection. Perspective transformation (i.e., transformation of a meaning perspective), on the other hand, is an infrequent occurrence; it involves critical reflection of distorted presuppositions. The trigger for perspective transformation may be acute in the form of a crisis (i.e., "disorienting dilemma") or may be more slow going through an accumulation of transformed meaning schemes.

Mezirow (1991) reminds us that not all learning is transformative. He identifies "four processes of learning - by extending meaning schemes, creating new ones, transforming old ones, and transforming perspectives" (p. 212). He does, however, see the ultimate role of the adult educator as facilitating the transformation process. "We professional adult educators have a commitment to help learners become more imaginative, intuitive, and critically reflective of assumptions;
to become more rational through effective participation in critical discourse; and to acquire meaning perspectives that are more inclusive, integrative, discriminating, and open to alternative points of view. By doing this we may help others, and perhaps ourselves, move toward a fuller more dependable understanding of the meaning of our mutual experience” (p. 224).

Before moving on to the next section, the reader is reminded that the transformative perspective of adult education is also firmly grounded in a constructivist epistemology. Mezirow (1978) speaks of “restructuring one’s frame of reference for making and understanding meaning” (p. 104), and of “restructuring one’s reality” (p. 105). The next section, The Social / Situated Perspective of Adult Education is also firmly grounded in constructivism.

Social Situated Perspective

Introduction

Jarvis (1992), in his book, Paradoxes of Learning: On Becoming an Individual in Society, points to the self-contradictory nature of research on learning that tries to
separate learners from the social context of learning, instead of trying to understand the social process of learning. The "Social" (or "Situated") perspective of adult education focuses on the relationship between learning and the social situation in which it occurs (Lave & Wenger, 1991). Some basic tenets of the social / situated perspective will be given in an overview before moving on to two specific and practical applications of the perspective: cognitive apprenticeship, and self-efficacy. Cognitive apprenticeship e.g., (Collins, et al., 1991) represents an instructional model that allows for the development of cognitive skills. As an instructional strategy, it is particularly appropriate for developing some of the teaching skills addressed in the resident TEP. Bandura's (1986) social cognitive theory represents a theoretical framework for understanding motivation, thought, and action. Self-efficacy (Bandura, 1977) represents an important facet of social cognitive theory in dealing with the interrelationship between knowledge and action (i.e., behaviour). Of special interest to this dissertation is the concept of "teaching self-efficacy" e.g., (Ashton, 1984) given that a change in teaching self-efficacy is the major outcomes measure of this research project.

The language of constructivism appears throughout this (and other authors') discussion of the social / situated perspective of adult education. In fact, Duffy and Jonassen (1991), in
their essay on the implications of constructivism for instructional technology, confuse some of the principles of constructivism with those of a social / situated perspective. Although grounded in constructivism, the social / situated perspective's focus on context is in direct contradistinction to constructivists who assume that cognitive representation is prior to all else. "A theory of situated cognition suggests that activity and perception are importantly and epistemologically prior - at a nonconceptual level - to conceptualization and that it is on them that more attention needs to be focused" (Brown, Collins, & Duguid, 1989, p. 41). Brown, Collins, and Duguid (1989) recommend that we "abandon the notion that (concepts) are abstract, self-contained, entities" (p. 33) and use the analogy of "tools" to demonstrate how knowledge, like tools, is situated in the context of their use. Both "can only be fully understood through use, and using them entails both changing the user's view of the world and adopting the belief system of the culture in which they are used" (p. 33). Lave and Wenger (1991) view situated learning as an intermediary between learning as an individual cognitive process and learning as a characteristic of social practice. In their view, "learning is not merely situated in practice - as if it were some independently reifiable process that just happened to be located somewhere; learning is an integral part of generative social practice in the lived-in-world" (p. 35). According to
Wilson (1993), cognition exists in its relationship among individuals in a cultural setting, and that traditional views of education have focused too heavily on individual internal cognition. Although he credits Schon (see "reflection" above) for providing a framework that comes closest to accounting for the situated nature of adult cognition, he criticizes him for not specifically addressing the interpersonal dynamics of practice or its "tool dependence." It is for these same reasons that Schon's (1987) work is discussed in the above section on constructivism rather than in the present section.

Brown, Collins, and Duguid (1989) maintain that knowledge (and not just learning) is situated. Knowledge is "indexed" by the context or situation in which it was learned. They draw parallels between the indexed and situated nature of knowledge with that of language. The evolution of a concept, like that of a word, becomes increasingly "textured" with the situation of each use. Therefore, concepts, like words, are continually under construction and part of their meaning comes from the context of their use. The situation in which a concept is learned, thereby, becomes part of its meaning. The idea of indexicality underscores the importance of understanding the situations in which specific learning takes place and the difficulty of transferring learning across contexts. This is particularly important in the difficult
transfer from "schooling" to the real world (Duffy and Jonassen, 1991). Educators trying to decontextualize concepts (e.g., learning metacognitive skills or problem solving skills outside a specific content area) may find the same lack of transfer. Duffy and Jonassen (1991) contend that experience is not only important for understanding concepts, but also for making them available for future use. An everyday example of the indexed nature of knowledge comes from recognizing people and knowing who they are. For instance, outside the usual context of our workplace, we may recognize coworkers (and even say "hello") but not be able to "place them" (i.e., remember who they are out of context). Therefore, students should learn (and apply) concepts under varying circumstance (Spiro, Feltovich, Jacobson, & Coulson, 1991). The idea is not to find some common underlying principles but to understand the concept from multiple perspectives for eventual use. The authors argue that criss-crossing the landscape of contexts is critical to instruction. Assumptions that knowledge is something devoid of context leads to teaching methods that ignore the way situations structure cognition. It is essential, therefore, that learning be rooted in authentic activity.

Lave and Wenger (1991), in their book, Situated Learning: Legitimate Peripheral Participation, mould the concept of situated activity into a theoretical perspective for
understanding learning. Their perspective emphasizes the relational character of knowledge and learning and the negotiated character of meaning. They argue that all activity is situated. They also emphasize comprehensive understanding as a “whole person.” Learning is viewed, not as the acquisition of knowledge transferred by instruction nor as the imitation of others, but as a form of social coparticipation. They concern themselves more with the types of social opportunities that provide the optimal context for learning than with cognitive processes and conceptual structures. “The individual learner is not gaining a discrete body of abstract knowledge which (s)he will then transport and reapply in later contexts. Instead, (s)he acquires the skill to perform by actually engaging in the process, under the attenuated conditions of legitimate peripheral participation” (original emphasis) (p. 14). Legitimate participation is concerned with actual practice and refers to what other authors have called “authentic activity” e.g., (Collins, et al., 1991). Peripheral participation involves limiting learners’ involvement in (and responsibility for) the end “product” during learning. Learners, therefore, move from the periphery of a practice towards its centre while developing increasing skills.

The authors distinguish between a learning curriculum consisting of situated opportunities and a teaching curriculum
constructed for instruction. A self contained teaching curriculum is by its very nature limiting. Learning, therefore, becomes a question of access to legitimate practice as a learning resource rather than providing instruction.

Lave and Wenger maintain that learning and the development of a sense of identity are inseparable. "Moving towards full participation in practice involves not just greater commitment of time, intensified effort, more and broader responsibilities within the community, and more difficult and risky tasks, but, more significantly, an increasing sense of identity as a master practitioner" (italics mine) (p. 111). This last idea is not unlike the development of increasing self-efficacy through the cultivation of personal mastery experiences (Bandura, 1977).

**Cognitive apprenticeship**

Collins, Brown, and Holum (1991) present cognitive apprenticeship as a learning model based on traditional apprenticeships while retaining elements of "schooling." The key to their model is making thinking "visible" (viz., cognitive). During traditional apprenticeships, learners move increasingly away from the role of passive observers and increasingly towards the independent accomplishment of tasks
Lave and Wenger (1991) centre much of their discussion of legitimate peripheral participation around examples of traditional apprenticeship. Collins, Brown, and Holum (1991) delineate four important aspects of the traditional apprenticeship: modelling, scaffolding, fading, and coaching. Modelling allows learners to watch masters at work. Support for learners during actual practice is provided for in the form of scaffolding. This may involve doing part of the work, giving advice, etc. Fading implies providing less scaffolding. Coaching includes the first three aspects (i.e., modelling, scaffolding, and fading), as well as providing evaluation and feedback among other things. In short, coaching indicates supervising students' learning. The authors remind us that providing students with a "conceptual model - a picture of the whole - is an important factor in apprenticeship's success in teaching complex skills" (p. 9). It provides learners with advanced organizers and a model for interpreting the activities of coaching. It will also serve as an internalized guide for eventual independent practice.

The "work" of cognitive skills (e.g., problem solving) is not directly observable to students, and students must make assumptions about the actual process. Students, therefore, do not have a conceptual model of the skill being learned. Collins, Brown, and Holum (1991) translate the salient
features of the traditional apprenticeship into a model of cognitive apprenticeship. They identify three essential requirements: (1) identify the processes of the task and make them visible to students, (2) situate abstract tasks in authentic contexts, so that students understand the relevance of the work, and (3) vary the diversity of situations and articulate the common aspects so that students can transfer what they learn. The traditional apprenticeship is by definition completely situated in the workplace. It is important to situate the tasks of the cognitive apprenticeship in authentic activities. "In traditional apprenticeship, the skills to be learned inhere in the task itself....The tasks in schooling, however, demand that students be able to transfer what they have learned. In cognitive apprenticeship, the challenge is to present a range of tasks, varying from systematic to diverse, and to encourage students to reflect on and articulate the elements that are common across tasks" (italics mine) (p. 9).

The authors propose a framework for designing learning environments using the cognitive apprenticeship. The framework consists of four dimensions: content, method, sequencing, and sociology. The content dimension identifies the types of knowledge required for expertise: domain knowledge, heuristic strategies (i.e., "rules of thumb" or "tricks of the trade"), control strategies (i.e., metacognitive
skills), and learning strategies. The methods to promote the development of expertise include those discussed in the traditional apprenticeship - modelling, coaching, scaffolding, and fading) - as well as articulation (to make students' thinking visible), reflection, and exploration (to challenge students). Sequencing of the learning activities is also important. Students should develop a conceptual model of the whole task before performing subtasks (i.e., global skills before local). With increasing experience, tasks should become increasingly complex and diverse. Sociology refers to the social characteristics of learning environments. Learning must be situated in authentic activities. Students should learn by actively using knowledge rather than passively receiving it. Educators should strive to create a community of practice. This "refers to the creation of a learning environment in which the participants actively communicate about and engage in the skills involved in expertise...Such a community leads to a sense of ownership, characterized by personal investment and mutual dependency" (p. 45). Intrinsic motivation for the development of expertise should be fostered rather than for extrinsic reasons (e.g., grades). The authors also encourage educators to exploit cooperation by encouraging group problem solving.
Self-Efficacy

Behaviour is not solely regulated by external outcomes, otherwise “people would behave like weathervanes, constantly shifting direction to conform to whatever momentary social influence happened to impinge upon them. In actuality, people possess self-reflective and self-reactive capabilities that enable them to exercise some control over their thoughts, feelings, motivation, and actions....Human functioning is, therefore, regulated by an interplay of self-generated and external sources of influence” (italics mine) (Bandura, 1991, p. 249). These “self-regulatory” processes are at the core of purposeful behaviour. Through forethought, they manifest themselves as beliefs about capabilities and the likely consequences of specific behaviours. They enable goal setting and preparing plans for action. Forethought may also serve to motivate.

Bandura’s (1986) social cognitive theory attempts to explain behaviour as a function of self-regulative mechanisms. He identifies three principle subfunctions of self-regulative mechanisms: (1) self-monitoring of one’s behaviour, its determinants, and its effects, (2) judgment of one’s behaviour in relation to personal standards and environmental circumstances, and (3) affective self-reaction. Among the self-
regulatory mechanisms, none is more central or universal as personal beliefs about capabilities: self efficacy (Bandura, 1977). Self-efficacy "plays a central role in the exercise of personal agency by its strong impact on thought, affect, motivation, and action" (Bandura, 1991, p. 248). It is important to distinguish between self-efficacy and social cognitive theory. Social cognitive theory is a multifaceted theory involving many determinants of behaviour of which self-efficacy is only one. Therefore, self-efficacy is only one factor operating within a more complex causal relationship.

Social cognitive theory as applied to adult education, is an example of the social / situated perspective. Bandura, himself, in a lecture given at the annual meeting of the American Educational Research Association (1992), cites "cognitive modelling" (cf., cognitive apprenticeship) as an important method for cultivating mastery experiences. He also discussed other important aspects of a social / situated perspective.

Social cognitive theory advocates a multifaceted approach to suit an achievement. Ability is construed as a changeable attribute over which one can exercise some control. Guided mastery serves as the principle vehicle for the cultivation of competencies. Cognitive modelling and direct tutelage are used to transmit relevant
knowledge and strategies. Guided practice is provided in when and how to use cognitive strategies in the solution of diverse problems. Activities, incentives and personal challenges are structured in ways that ensure self-involving motivation and continual involvement in academic activities. Growing proficiencies are credited to expanding personal capabilities. Each of these models of influence is structured in ways that strengthen students' self beliefs that they have what it takes to exercise control over their own self development (Bandura, 1992).

The literature on the social / situated perspective of adult education demonstrates that knowing “what” does not necessarily mean knowing “how” (e.g., Lave and Wenger, 1991). Bandura's work on self-efficacy takes this idea one step further. Knowing “how” does not necessarily mean believing one “can” (and consequently “will”). Therefore, situating learning in authentic activity is not only important in providing the learner with knowledge and skills but in providing successful experiences (i.e., mastery experiences) and thereby, enhancing students’ self-efficacy. Bandura (1992) argues that “efficacy demonstration trials” need to be built into learning experiences. He contends that if individuals try their newfound skills at the wrong time or in
the wrong place, the resulting loss of efficacy beliefs may negate any gains of learning. Therefore, self-efficacy belief is an important antecedent of behaviour but is only partially dependent on inherent skill. Successful performance, therefore, requires both skills and the efficacy beliefs to use them.

The conception of human ability has undergone considerable change in recent years. Ability is not a fixed attribute in one's behavioural repertoire. Rather, it is a generative capability in which cognitive, social, motivational and behaviour skills must be organized and effectively organized, orchestrated for diverse purposes. It also involves skill in managing emotional reactions that can impair the quality of thinking and of action. There is a marked difference between possessing knowledge and skills and being able to use them well under taxing conditions (Bandura, 1992).

Bandura (1977) postulates that individuals develop outcome expectations based on life experiences, and efficacy beliefs concerning their ability to cope. That is, outcome and efficacy are separate components of efficacy expectations. First of all, individuals must believe that the specified action will lead to the desired outcome (i.e., outcome expectation). Secondly,
they must believe themselves capable of the specified action (i.e., self-efficacy belief). The expectations of personal mastery are important for initiating a behaviour, and for perseverance in the face of difficulties. Lack of expectations of personal efficacy play an important role in avoidance behaviour. It is important to realize that efficacy expectations are not the sole determinants of behaviour. Someone may not initiate a task, despite strong self-efficacy, if there is no incentive to do so.

The dimensions of efficacy expectations include magnitude, strength, and generality (Bandura, 1977). When rank ordering a task according to difficulty, some individuals' efficacy beliefs may be limited to lower levels of difficulty (i.e., low magnitude). Efficacy expectations also differ in strength. Individuals with weak expectations are more likely to give up when experiencing a set back, whereas, those with a strong sense of self-efficacy are more likely to persist. Some efficacy expectations may be narrowly specific to the given tasks, whereas, other efficacy beliefs may be generalized beyond the specific situation. For the most part, efficacy beliefs tend to be specific and tied to "domains of functioning" (Bandura, 1992). Bandura is critical of what he call "omnibus" tests to measure several facets of self-efficacy. Instead, he suggests using domain related scales. A more generalized sense of self-efficacy is not necessarily advantageous; some individuals
may have mistaken efficacy beliefs. On occasion, "people can have profound experiences in which they actually change fundamentally their belief about their cognitive power" (Bandura, 1992) (cf., Mezirow's perspectives transformation, e.g., Mezirow, 1991). Thereafter, they apply their efficacy beliefs across a wider domain of behaviours.

Efficacy expectations come from four sources: (1) performance accomplishments, (2) vicarious experience, (3) verbal persuasion, and (4) emotional arousal (Bandura, 1986). Performance accomplishments "provide the most influential source of efficacy information because it is based on authentic mastery experiences" (italics mine) (Bandura, Adams, and Beyer, 1977, cited in Bandura, 1986, p. 399). Successes lead to an enhanced sense of self-efficacy, whereas, failures tend to extinguish it.

Self-efficacy judgments have several functions and effects (Bandura, 1986). Choice behaviour is in part determined by efficacy beliefs. Avoidance behaviour is associated with a weak sense of self-efficacy. The stronger the perceived efficacy, the higher the goal challenges people set for themselves. When faced with difficulties, self-efficacy plays a considerable role in determining effort expenditure and perseverance. Thought patterns and emotional reactions
under aversive conditions are also influenced by efficacy beliefs. People who view themselves as inefficacious dwell on inadequacies and "blow" difficult situations out of perspective, whereas, those with strong efficacy beliefs focus their cognitive energy and attention on the difficult situation and mobilize greater effort to the task at hand. "Research shows that people who regard themselves as highly efficacious, act, think, and feel differently from those who perceive themselves as inefficacious. They produce their own future, rather than simply foretell it" (Bandura, 1986, p. 395).

Efficacy beliefs also play a key role in motivation. As discussed, they determine the goals people set for themselves, how much effort they expend, and how much they persevere in the face of difficulties. In contrast, most theories of motivation are founded upon a negative feedback system (Bandura, 1992). In this view, discrepancy between one's perceived performance and an adopted standard motivates action to reduce the disparity. Motivation by negative discrepancy tells only half the story, and not necessarily the more interesting half according to Bandura.

Self efficacy, like constructivism, aspires to move beyond behaviourism by highlighting the importance of cognitive processes and the development of beliefs as guides for action.
The cognitive processing of efficacy information is more important than the "objective" information. Successes must be viewed as resulting from skill rather than chance or monumental effort. How individuals construe ability is meaningful for cognitive processing of efficacy information. Mary Bandura (1983) found that children who construe ability as acquirable, seek challenges that provide opportunities to expand their knowledge and competencies. Errors are seen as a natural part of learning by these children. They judge their capabilities more in terms of personal improvement than by comparison against the achievement of others. Other children construe ability as an inherent capacity. They view performance as diagnostic of their inherent intellectual capabilities (or lack thereof). Therefore, they prefer tasks that minimize errors and reveal their proficiency at the expense of expanding their knowledge and their competencies. Having to exert high effort is also threatening to these children because it presumably reveals that one is "not smart." The successes of others belittle their own perceived ability. Along the same lines as how individuals construe ability, people's beliefs about the extent to which their environment is controllable plays a role in the cognitive processing of efficacy information.

Since most activities do not provide objective standards for assessing capabilities, people must, therefore, assess their
capabilities in relation to the attainments of others (Bandura, 1992). In an educational setting, this often takes the form of feedback. Feedback that focuses on achieved progress (i.e., positive feedback) underscores personal capabilities, whereas, negative feedback highlights personal deficiencies. According to Bandura, highlighting gains magnifies perceived efficacy, aspirations, efficient analytic thinking, and self satisfaction in performance accomplishments.

**Teaching Efficacy**

Although the concept of self-efficacy was initially proposed as a means of intervention for psychotherapy, parallels can be extended to the field of education. Bandura, Jeffery, and Gajdos (1975, cited in Bandura 1977) report that the "results of recent studies support the thesis that generalized, lasting changes in self-efficacy and behaviour can best be achieved by participant methods...initially to develop capabilities, then removing external aids to verify personal efficacy, then finally using self directed mastery to strengthen and generalize expectations of personal efficacy" (p. 202). Although drawn from the psychotherapeutic literature, the wording of the above comment is strikingly consistent with that used in descriptions of cognitive apprenticeship (e.g., Collins, Brown,
and Holum, 1991). Enochs and Riggs (1990) also suggest that self-efficacy can be used in teacher training programs through microteaching and field experiences.

Patricia Ashton (1984) reviews the concept of teacher efficacy as a motivational paradigm for effective teacher education. She defines a teachers’ sense of efficacy as “the extent to which teachers believe that they have the capacity to affect student performance” (p. 28). She credits two Rand Corporation studies (Armor, Conry-Osequera, Pascal, Pauly, & Zellman, 1976; Berman, McLaughlin, Bass, Pauly, & Zellman, 1977, cited in Ashton, 1984) for introducing the construct of self-efficacy into the educational literature. She goes on to outline the four essential components of a motivation program: (1) conceptualization of the attitude, (2) self study in relation to the attitude, (3) planning and goal setting, and (4) group support. She goes on to describe how each of these components could serve as the basis for a teacher education program founded on the construct of self-efficacy. First of all, a clear concept of efficacy beliefs and how these beliefs translate into behaviours should promote the relationship between efficacy beliefs and behaviours. Efficacy beliefs must also be reconciled with the individuals' other beliefs. Accordingly, Ashton identifies eight dimensions of teacher efficacy: (1) a sense of personal accomplishment, (2) positive
expectations for student behaviours and achievement, (3) personal responsibility for student learning, (4) strategies for achieving objectives, (5) positive affect, (6) sense of control, (7) sense of common teacher-student goals, and (8) democratic decision making. In terms of goal setting, Ashton comments that teachers are “surprisingly unreflective about their work” (p. 31), and that this should be a specific goal of teacher education programs. Both Schon’s (1987) and Mezirow’s (1991) models seem particularly well suited for this role. Finally, Ashton promotes the use of group support to maintain motivation in TEPs devoted to increasing teacher efficacy.

Gibson and Dembo (1984) undertook a study to provide construct validation support for teacher efficacy. They factor analyzed a 30 item 6 point Likert scale and identified two dimensions that corresponded to Bandura efficacy expectations (see above). A belief in “teaching efficacy” (i.e., that teachers can make a difference) corresponded with Bandura’s “outcome expectancy”, whereas, a belief in “personal teaching efficacy” (i.e., that they personally can effect change as teachers) corresponded with Bandura’s “self-efficacy.” The results were also compatible with Ashton and Webb (1986) two dimensional model of self-efficacy. Internal consistency reliability was evident using Cronbach’s alpha
coefficients (r=0.79 for 16 of the 30 items). The authors went on to use the multitrait-multimethod analysis to demonstrate convergent and divergent validity from data on three traits (i.e., self-efficacy, verbal ability, and flexibility) using two methods. Finally, classroom observations were used to identify differences in the behaviour of low vs. high efficacy teachers. A positive relationship between teachers' perceived self-efficacy and effective teaching behaviours was demonstrated. Teachers with a sense of instructional efficacy devoted more classroom time to academic learning and provided students experiencing difficulties with the help they needed to succeed and then praised them for their accomplishments. In contrast, teachers with a low sense of instructional efficacy spent more time on nonacademic pastimes, readily gave up on students if they did not get quick results, and criticized them for their failures. Thus, teachers who believe strongly in their teaching efficacy create mastery experience for students and those besieged by self doubts create classroom environments that undermine students' sense of efficacy and cognitive development. Therefore, teachers with a low sense of teaching efficacy may "pass down" their lack of efficacy beliefs to their students.

Enochs and Riggs (1990) developed a two dimensional scale to measure elementary science teaching efficacy. They used
Gibson and Dembo's instrument as a model. Reliability analysis, using Cronbach's alpha, produced a coefficient of 0.90 for all 13 items of the "Personal Science Teaching Efficacy Scale," and a coefficient of 0.76 for the "Science Teaching Outcome Expectancy Scale."

Ashton and Webb (1986), in their book, *Making a Difference: Teachers' Sense of Efficacy and Student Achievement*, neatly summarize teaching self-efficacy:

The construct of teachers' sense of efficacy refers to teachers' situation-specific expectations that they can help students learn. Teachers' efficacy expectations influence their thoughts and feelings, their choice of activities, the amount of effort they expend, and the extent of their persistence in the face of obstacles (Bandura, 1981). For example, teachers with a low sense of efficacy doubt their ability to influence student learning; consequently, they tend to avoid activities they believe to be beyond their capabilities. They reduce their efforts or give up entirely when confronted with difficulties. They are preoccupied with thoughts of their own inadequacies and believe their difficulties are more serious than they actually are. Their preoccupation with their own limitations raises their level of stress and
reduces their teaching effectiveness by diverting their attention from the demands of instruction to worries about their personal competence. In contrast, teachers with a strong sense of efficacy believe that they are capable of having a positive effect on student performance. They choose challenging activities and are motivated to try harder when obstacles confront them. They become engrossed in the teaching situation itself, are not easily diverted, and experience pride in their accomplishments when the work is done (p. 3).

Ashton and Webb also divided teaching efficacy into two dimensions: sense of teaching efficacy, and sense of personal teaching efficacy. They propose an “ecological framework,” for studying teaching efficacy, based on four assumptions: (1) The study of teachers’ sense of efficacy requires an exploration of the subjective perceptions of teachers; (2) Teachers’ sense of efficacy is context-specific. It varies with specific characteristics of the teaching situation; (3) Teachers’ sense of efficacy is affected by direct and indirect influences; direct influences include the students in the classroom and the principal. Indirect influences include the students’ families, the school organization, the community, an the culture; (4) Teachers’ sense of efficacy is reciprocally determined; it affects teachers’ behaviour and is, in turn, influenced by the
teachers' perceptions of the consequences of that behaviour (p. 13).

Guided by their ecological framework, the specific objective of their study was to investigate the following: (1) the nature of teachers' efficacy attitude, (2) factors that facilitate and inhibit development of a sense of efficacy, (3) teacher behaviours associated with teachers' sense of efficacy, and (4) the relationship between teachers' sense of efficacy and student achievement (p. 25). They used both qualitative and quantitative methods of data collection and analysis.

Although the results of the study are too numerous to report in detail, several merit mentioning. First, they describe the attitude of teachers with a high and low sense of self-efficacy in relation to their beliefs and behaviours: “Low efficacy attitude was related to a distrust of low-achieving students; discomfort in low-achieving classrooms; a control orientation in discipline matters; a reliance on positional authority; the use of embarrassment and excommunication as behaviour management devices; the sorting and classifying of students by ability; a willingness to ignore the lowest achievers in the room and to send them from the class; a de-emphasis on instruction and the importance of learning; an inability to ignite student interest in academic work; and an unwillingness
to push students and to closely monitor their academic progress. High efficacy attitude was related to a belief that all students can learn and want to do so; efforts to establish warm and encouraging relationships with students; the conviction that students will behave well if treated fairly, firmly, and with consistency; a reliance on personal authority; the use of direct, nonemotional management techniques; a reluctance to embarrass students; an effort to treat all students as capable and trustworthy; an emphasis on instruction and the importance of learning; an effort to keep students on task, interested, and aware of their individual accomplishments; a willingness to teach all students in the class, to push them, and monitor their work; and the determination not to accept student failure (p. 86-87).

Second, they report on the major cultural themes distinguishing schools. Specifically, they looked at teachers' conception of teaching as either an exalted or burdened profession, whether teachers perceived their role as one of student development or academic instruction, and some organization features of school and teachers' sense of efficacy. Their findings lead them to conclude that school organization, leadership, and ethos play a role in establishing and maintaining teachers' sense of efficacy. Finally, a relationship between teachers' sense of efficacy and student achievement
was demonstrated. This relationship was found to be situation specific and there was not necessarily transfer across content areas (e.g., math vs. reading). Similarly, efficacy beliefs were specific to the context of teaching (e.g., lecture vs. small group discussion). Ashton and Webb review a number of studies all consistent with their significant correlations between teaching behaviours and student achievement. They caution, however, making an inferences about a causal relationship given the correlational nature of these (and their own) studies. They also point to the reciprocal relationship between teaching efficacy and student achievement outlined in their theoretical framework (see above). They conclude by arguing that “the promotion of a high sense of efficacy in teachers and students must become an educational aim as important as academic achievement” (p. 176).

Empirical Perspectives Pertinent to Resident Teps

The focus will now move away from theory to practice. This section of chapter two begins with a look at ways to improve teaching. Next, the existing literature on residents as teachers will be reviewed. Finally, a detailed review and analysis of the literature on resident TEPs will be undertaken.
Improving Teaching

Cantrell (1973) describes the defeatist attitude adopted by many medical teachers and speculates that this attitude is based on the belief “that teachers are born, not made. This hypothesis underlies an almost fatalistic acceptance of ‘teaching skill’ as a set of indefinable qualities that are innate, perhaps genetically determined, and incapable of change” (p. 724). Whitman (1982) uses a similar analogy in his book, There is No Gene For Good Teaching: A Handbook on Lecturing for Medical Teachers. Rippey (1980), in his book, The Evaluation of Teaching in Medical School, also argues against the fact that the traits of a good clinical teacher are indefinable and innate. The three major points in his book are that: (1) teaching makes a difference; (2) teacher behaviour can be improved; and (3) evaluation of teaching is possible. He stresses, however, that the evaluation of teaching does not in and of itself necessarily lead to an improvement in instruction. That the evaluation of teaching can lead to improvements in teaching, however, has been investigated by Rous, and colleagues (1972). They believed that helping clinical teachers to establish their strengths and weaknesses could bring about an improvement in the quality of medical instruction, and this was suggested by the results of their study. They did caution, however, that the voluntary nature
of the evaluation, and the fact that the process was regarded as threatening by many faculty members, resulted in targeting only the least threatened and best instructors. Those that needed improvement most were, therefore, excluded.

Acknowledging that insight (i.e., the results of evaluation) is a necessary but not sufficient condition for change (i.e., improvement of teaching), many prominent medical educators believe that the evaluation process, along with teaching seminars / workshops, should be seen as part of faculty development. The literature is replete with the beneficial results of clinical teacher training programs (e.g., Adams, et al., 1974; Bazuin & Yonke, 1978; Cassie, et al., 1977; Patridge, et al., 1980; Sheets & Henry, 1984; Skeff, et al., 1984). Similar success has been noted with resident TEPs (e.g., Greenberg, Goldberg, & Jewett, 1984; Irby, Vontver, & Stenchever, 1982; Lawson & Harvill, 1980; Lazerson, 1973; Pristach, Donoghue, Sarkin, Wargula, Doerr, Opila, et al., 1991). More recently, it has been suggested that preparation for the teaching role should begin at the undergraduate level, and some schools now offer such an elective to their medical students (Craig & Page, 1987; Sobral, 1989).

That some clinical educators have a "natural" ability is evident by their superior skills without any formal education training. However, these skills are innate and unchangeable. Maxwell,
Cohen, & Reinhard (1983) argue that “attendings who are most respected as teachers vary greatly in their teaching techniques. However, improvements within each of these techniques are clearly possible for most teaching attendings” (p. 194). How best, then, can these changes be brought about? Skeff, Berman and Stratos (1988) review the various methods to improve clinical teaching. Feedback from students, alone, was not consistently effective (Rotem & Glassman, 1979; Rous, et al., 1972; Skeff, 1983; Stillman, 1983). However, when combined with self-assessment, consultation by a professional educator, or programmed feedback booklets, student feedback became effective (Aleamoni & Hexner, 1980; Centra, 1973; Cohen & Herr, 1982; McKeachie, 1979; Pambookian, 1976). Interestingly, despite the fact that educators rarely watch their colleagues teach, peer review proved to be somewhat effective (Adams, et al., 1974; Centra, 1975; Sell, 1986; Skeff, 1981). Skeff, Berman and Stratos (1988) suggest that peer evaluation may be more useful for residents than faculty. Consultation with professional educators, either as participant observers or in reviewing videotapes of teaching, proved to be an effective, albeit time intensive and cost-ineffective approach for improving clinical teaching (Foley, 1976; Irby, DeMers, Scher, & Matthews, 1976; Patridge, et al., 1980; Wergin, Mason, & Munson, 1976). Several studies have established the effectiveness of videotape review of teaching, either alone or
with other (including professional educators) (e.g., Jewett, Greenberg, & Goldberg, 1982; Mahler & Benor, 1984; Sheets & Henry, 1984; Skeff, 1983; Skeff, et al., 1984). Skeff and colleagues (1988) caution, however, the potential for a negative impact of this method. Reviewing one's teaching on videotape can be a stressful experience; some teachers may choose not to participate. “If videotape review leads the viewers to perceive their performance as deficient, they may have lowered their *self confidence* in their ability to teach. This negative effect may not only decrease teachers' motivation to change their teaching, but may even decrease their desire to teach at all” (italics mine) (p. 100-101).

Therefore, precautions must be taken to provide a psychologically safe environment in order that self-efficacy not be impaired. The value of self-evaluation for improving teaching remains inconclusive (Carroll, 1983; Seldin, 1980). Concept based training is aimed at enhancing clinical teachers' understanding of the theoretical and conceptual basis of teaching. The two programs reviewed (i.e., Gliessman & Pugh, 1978; Skeff, Stratos, Campbell, Cooke, & Jones, 1986) were both effective. Finally, Skeff and colleagues (1988) review seventeen multicomponent methods: workshops and seminars (e.g., Camp & Hoban, 1988; Medio, Wilkerson, Lesky, & Borkan, 1988; Pristach, et al., 1991; Sobral, 1989). They comment that although single component methods for
improving teaching have not been shown to be consistently effective, that the most convincing evidence for effectiveness comes from multicomponent methods. The relative contribution of each component, however, has not been identified.

Residents as Teachers

Steward and Feltovich (1988) address why residents should teach and discuss the parallel processes of teaching and learning. One of the obvious benefits is the acquisition of teaching skills that can be used for patient education or in preparation for academic careers. They argue that by constantly reviewing, reorganizing, and using information, residents increase their knowledge base. Residents are frequently challenged by students' questions and the need to provide explanations. The authors contend that teaching during residency may promote ongoing self improvement and help residents develop the skills required to maintain lifelong professional competency. The personal benefits of teaching were recognized by more than two thirds of residents in one study (Apter, Metzger, & Glassroth, 1988), and 90% in another (Barrow, 1966). Stritter, Shahady, and Mattern (1988) propose a model for the professional development of residents
and maintain that teaching plays an important role in the
development of professional competence. Schiffman (1986)
remarks that teaching not only benefits residents and their
students, but patients as well. By having patients’ cases
discussed by team members during the teaching process,
residents’ thoughts and actions are examined and questioned
by other team members who can also make suggestions about
diagnostic and therapeutic plans.

Medical students frequently consider residents to be their
most important teachers and look forward to a teaching role
during residency (Barrow, 1966). Another study, conducted
more than twenty five years later, confirms these findings
(Bing-You & Sproul, 1992). Brown (1970), in a study of
housestaff attitude towards teaching, found that residents
provide the majority of clinical instruction. According to his
findings, no one is more available to students and junior
housestaff through all aspects of medical care, even through
the night. He argues that without residents, clinical faculty
would need to be available 24 hours a day. He found that all
residents consider themselves to be teachers, and spend 20-
25% of their time supervising, evaluating, or teaching others.
Residents also attribute 40-50% of their own teaching to other
housestaff. These findings are in keeping with more recent
studies. Undergraduate surgery students credited housestaff
for providing almost one third of the knowledge acquired during their rotation (Lowry, 1976). In another study (Bing-You & Harvey, 1991), students estimated that one third of their knowledge could be attributed to housestaff teaching.

Steward and Feltovich (1988) argue that "for teaching medical students, no one is more available or better qualified than a resident" (p. 4). Residents occupy an intermediate position between faculty and students in terms of knowledge, authority, experience, and are less intimidating to students. Their proximity, in terms of level of training, enables them to better understand the practical needs and problems of students. Tremonti and Biddle (1982) stress that residents' roles as teachers are complimentary, and not redundant, with that of faculty. Residents concentrate on daily patient care issues on a large number of patients and spend more time on the ward and at the bedside. Faculty, on the other hand, stress in depth discussion, psychosocial issues, and problem solving skills on a small number of patients. Camp and Hoban (1988) identified the teaching settings encountered by residents: (1) Case presentations; (2) Teaching on work rounds; (3) Teaching clinical skills course to undergraduate medical students; (4) Large group presentations / lectures; (5) Small group presentations / seminars. Although residents are occasionally called upon to lecture and do presentations, most
of their teaching occurs in small groups using a dynamic tutorial style. Apter, Metzger, and Glassroth (1988) quantified the most frequent teaching settings among residents: patients' bedside (45.5%); one-to-one supervision of junior team members (25.5%); “sit-down” ward rounds (23.6%).

That residents spend more time with students and are “closer” to their level does not necessarily make them effective teachers. Irby (1978) found that although students rated residents as being more involved in their clinical teaching, residents were thought to be less effective than faculty. Only 10% of students in another study (Brown, 1971) “felt that housestaff teaching was particularly effective when it was done at all” (p. 93). Wilkerson, Lesky, and Medio, (1986) studied the teaching skills of residents during work rounds. “The results...indicated that during work rounds the residents exhibited few of the teaching behaviours that can enhance learning in a patient care setting..., that students and interns were often passive members of the work team, with the majority of clinical decisions being made by residents.....Clinical reasoning, problem solving and supervised decision making were not recognized as learning goals that might be pursued while charts were being reviewed and patients were being visited....The resident appeared to conceptualize teaching as a classroom activity and equate it to
lecturing” (p. 827). Lewis and Kappelman (1984) noted that residents most frequently use an authoritarian lecture style in teaching. Ironically, this was residents’ least favourite approach as learners. Medio, Wilkerson, Lesky, and Borkan (1988) observed residents during work rounds.

Residents did not often intentionally use daily patient encounters for teaching. When they did intend to teach during work rounds, they usually provided brief lectures. Not only did the study show the limited repertoire of teaching skills used by most residents, but it also delineated the many teaching opportunities that were being overlooked. For most residents, teaching had become synonymous with prepared lectures and was, therefore, incompatible with the unpredictable demands of patient care (p. 215).

Although 69% residents in this study modelled empathic behaviour (towards patient), they rarely discussed these interactions with students. Patient visits were often used to verify history and physical findings (63%), but in most cases an opportunity to demonstrate clinical skills was missed. “Mini-lectures” occurred in 40% of interactions. Four teaching behaviours were used infrequently in the observed patient / resident interaction: (1) directing students to pertinent
literature (3%); (2) commenting on their performance (11%); (3) demonstrating a technique or skill (17%); (4) asking problem solving questions (22%). Two common non-facilitating teaching behaviours were noted: (1) silent attention to patient charts; (2) decision making without involvement of the team (>50%). Meleca and Pearsol (1988) urge that residents be made aware of and take advantage of their responsibilities and “teachable moments” (i.e., teaching opportunities). One study (Bergen, Stratos, Berman, & Skeff, 1993) compared the clinical teaching abilities of residents and attending physicians in the inpatient and lecture settings. Overall, residents and attendings received similar ratings. Where there was a difference, faculty were rated higher than residents. Of note, ratings for both groups were generally low in each category suggesting the need for participation in TEPs by both groups.

Residents generally have a positive “attitude” towards their role as teachers. The vast majority of residents enjoy teaching (89% of 68 respondents) (Apter, et al., 1988). In this study, enjoyment of teaching was positively associated with increased preparation time and perception of positive results of teaching. Bing-You and Harvey (1991) are the first to address whether an association between a positive attitude towards teaching and perceptions towards teaching are associated with
better student evaluations of teaching. Twenty one (of 24) residents completed a questionnaire in order to survey their attitude towards teaching. They were subsequently evaluated by third year medical students over a one year period. Residents' desire to teach was most strongly correlated (0.77) with active involvement of students and was the only "attitude" correlating with overall teaching effectiveness (0.54). Unfortunately, no correlation was found between student ratings of residents as teachers and residents' self-assessment of teaching effectiveness. Of note, residents having participated in a TEP were more confident as teachers, were rated more highly in actively involving students and in providing direction and feedback, and were also more confident as teachers.

Although residents have major teaching responsibilities, evidence exists that they may not receive enough support or preparation for this role and that barriers hinder optimal teaching. A US national survey of general surgical residency program directors (Anderson, Anderson, & Scholten, 1990) posed three questions: (1) To what extent do surgical residents teach and evaluate medical students? (2) How are surgical residents prepared for and evaluated on their teaching responsibilities? (3) What are the surgical program directors opinions about residents as teachers? Virtually all
(98%) surgical residents had teaching responsibilities. However, only 36% of programs provided residents with written evaluations of their teaching, and 60% of program directors did not believe it was important for residents to receive formal training in teaching skills. Only 14% of residents in this study had attended workshops on teaching. Two other studies (Callen & Roberts, 1980, Brown, 1971) report similar findings. Thirteen percent of 136 psychiatry residents, and 15% of 28 surgery residents had prior teacher training. A more favourable proportion (i.e., 38% of 21 residents) is cited in one study (Bing-You & Harvey, 1991). This likely reflects the author's prominent role in promoting and developing resident teaching skills at his institution. Schiffman (1986) asks: "How then do house officers learn how to teach? The obvious answer is that the house officer has had twenty years of observation of his or her own teachers upon which to model his or her style" (p. 55). This remains inadequate.

If most residents do not have prior teacher education, do they at least receive useful feedback on the teaching that they do? In 1978, the American Association of Medical Colleges (AAMC) surveyed departments of internal medicine, pediatrics, psychiatry, surgery, and family medicine (Tonesk, 1979). Only 87 of 319 (27%) programs included teaching
performance as part of residents’ evaluations, and those that did usually only required a global assessment of teaching ability. The data on supervision of teaching is equally bleak. Apter, Metzger, and Glassroth (1988) report that only 13% (of 68) residents felt that faculty supervision of their teaching was optimal, and 58% indicated that they had never been supervised. This lack of support may account for the unfavourable attitude that some residents have towards teaching. In one study (Callen & Roberts, 1980), 78% (of 136) psychiatry residents thought that “the main reason residents are required to teach medical students is to free up time, time for faculty to do research and other things.” On average, these residents estimated that they spent 9 hours per week in teaching activities. Despite this large teaching commitment, only 32% of residents thought that they should be required to attend TEPs. When the question of attending a resident TEP is posed differently, 53% (Apter, et al., 1988) to 66% (Brown, 1970) of residents stated they would be interested in attending a workshop if it were offered.

In addition to less than satisfactory support for their teaching role, residents face other impediments. Time and conflicting demands seem to be most important. Eighty seven percent of residents cited either their own or their students’ time-consuming ward duties as the greatest obstacle to teaching
(Apter, et al., 1988). Post call exhaustion was also an important factor (49%) making teaching difficult.

Kates and Lesser (1985) identify what they consider to be major problems faced by residents when teaching. They quote the AAMC report cited above (Tonesk, 1979) and admonish post graduate programs for the lack of emphasis placed on residents' teaching role. Beyond this, residents' may be unclear about what their actual role is in terms of supervising - teaching junior housestaff, and as mentioned, they are usually unprepared for their teaching function. Residents are usually unfamiliar with the learning objectives of the juniors they supervise and teach. Despite this, they are usually called upon to help evaluate them. The residents' own supervisors often provide inadequate supervision and support for residents. This, in itself, may downplay the importance of teaching for the resident. Finally, few programs make any specific efforts to coordinate teaching opportunities for residents with a special interest in education.

Acknowledging the many problems faced by residents when teaching, and their less than optimal preparation for their teaching role, not much is known regarding the needs of residents in terms of designing a TEP. Boulé and Chamberland (in press) addressed this issue from a residents' perspective by
asking them “What kind of training do you need to teach more effectively?” Eighty residents responded. Two thirds of their answers corresponded with needs usually addressed by TEPs, while one third were concerned with medical competency and time management. Nine key words were most frequently cited in their responses (in order of priority): (1) division of work / teaching time, (2) teaching methods, (3) medical knowledge, (4) objectives, (5) synthesis skills, (6) feedback, (7) motivation, (8) psychology applied to teaching, and (9) student problems. More research needs to be done in the area of the teacher education needs of residents. Other perspectives and other sources of information should compliment that of residents.

Empirical Research on Resident TEPs

An extensive review of the medical education literature was undertaken to identify existing studies of resident TEPs. Twenty-six references were identified between 1963 and 1991. Of the 26 reports, one study was described in three different publications (Greenberg, et al., 1984; Greenberg, Jewett, & Goldberg, 1988; Jewett, et al., 1982), and two studies were reported twice (Camp & Hoban, 1988; Camp, Hoban, & Katz, 1985) and (Lazerson, 1972; Lazerson, 1973). Furthermore,
chapter nine (Edwards, Kissling, Paluche, & Marier, 1988b) of Edwards and Marier's (1988) book, Clinical Teaching for Medical Residents: Roles, Techniques, and Programs, outlines a resident TEP used for two studies ("Phase I" and "Phase II") that were reported elsewhere (Edwards, Kissling, Brannan, Plauche, & Marier, 1988a; Edwards, Kissling, Plauché, & Marier, 1988). This program was also used for a third study (Edwards, Kissling, Plauche, & Marier, 1986). Therefore, a total of 21 different studies and 19 different resident TEPs were identified. Of the 19 resident TEPs, two actually depict undergraduate medical school electives: one offered as a third year elective (Craig & Page, 1987), the other as a fourth year elective (Sobral, 1989). Another program (Lazerson, 1972; Lazerson, 1973) can be more accurately described as a teaching experience under supervision rather than a resident TEP. This study describes the experience of psychiatry residents given the opportunity to teach undergraduate psychology at a community college. Although these residents received feedback on their teaching skills, no formal teacher training was undertaken. Consequently, only 18 studies described 16 programs in which residents underwent a curriculum with a specific goal of developing teaching skills.

A database was created extracting information from all studies for easy comparison. The information was organized into the
following fields: (1) Participation (voluntary or mandatory); (2) \( n \) (i.e., number); (3) Specialty (of residents); (4) level (i.e., postgraduate year (PGY) of training of resident); (5) Goals & Objectives (of TEP); (6) Methodology (i.e., study design); (7) Program Format; (8) Instructor(s) (i.e., professional educators or physicians); (9) Consultation(s) (i.e., whether or not professional educators were involved in program development or implementation); (10) Timeline (i.e., number of hours over what time frame); (11) Content (of TEP); (12) Program Evaluation (results); (13) Study Results; (14) Problems (identified); (15) Recommendations (practical).

The first resident TEP reported (Husted & Hawkins, 1963) dates back to 1963. This case study was initiated as a pilot project. The investigators asked department chairmen to invite two residents each to participate in the program. Given the voluntary nature of the course, residents could decline the invitation. A total of seven residents participated in the six "lecture-discussion" sessions. No attempt was made to assess outcome measures. Even the program itself was not assessed with any rigor. The authors conclude that "participants were certain enough that the pilot venture was of sufficient benefit to them to lead to the suggestion that the orientation be repeated and the invitations expanded..." (p. 115). The teaching role of residents has become increasingly more
prominent over the years, with 17 of the 26 references being published since 1985, and the recent publication of books on the subject (Edwards & Marier, 1988; Schwenk & Whitman, 1984; Weinholtz & Edwards, 1992). A summary of the medical education literature on this subject will be the focus of the remainder of chapter two.

**Participation**

Participation in the TEP was “voluntary” in 9 studies, “mandatory” in 6, and not stated in the remaining 7. Various arguments can be made for and against both strategies, but no conclusions can be drawn from these studies. Allowing residents to “opt-out” of TEPs, however, may result in neglecting those residents who need it most.

**Specialty**

General internal medicine is the most represented of all specialties among the studies reviewed. Internal medicine residents were involved in 11 of the 22 programs. Those studies (e.g., Edwards, et al., 1988) looking for distinctions between specialties generally found no significant differences.
No consensus exists as to when is the best time to introduce a resident TEP. A quick glance at the target audience (i.e., post graduate year of training) of the various TEPs outlined makes this clear. Five programs were geared to PGY 1 residents and four programs were geared to all levels of residency. Two programs were undergraduate medical school electives. Other levels were the target in five programs and no information was available for the remaining six. Only one study (Bing-You, 1990) addressed program outcomes in relation to level of training. Further studies are needed to define the best time to implement TEPs. “Readiness” to learn, level of professional competence, competing demands / availability, and cost effectiveness (e.g., final year residents only have a short teaching career remaining) are only a few of the factors to be considered.

**Goals and Objectives**

Goals and Objectives varied considerably between programs. Although none of the programs formally stated the theoretical underpinnings from which the goals and objectives emanated, the language used to describe them is revealing. The desire to
"transfer" information is prominent. Programs alternatively wanted to "acquaint residents with" (Husted & Hawkins, 1963), "provide information" (Brown, 1971), "introduce concepts" (Lewis & Kappleman, 1984), or have residents "gain knowledge / become familiar with" (Camp & Hoban, 1988; Camp, et al., 1985). Standard behavioural objectives were also common. For example, one program (Husted & Hawkins, 1963) expected participating residents to be able to "(a) select the appropriate (teaching) technique and (b) begin to develop skill in self-appraisal of their ability to effectively function in their teaching role" (p. 111), while another (Edwards, et al., 1988b) expected residents to "give feedback to learners" (p. 159). The wording in two further studies alludes to constructivism: (1) "The workshop's aim is not to teach "teaching skills," such as lecturing or running a tutorial, but to explore the organizational aspects of supervising a student such as the relationship between the resident and their own supervisor, and their understanding of the objectives of the clerk's rotation" (italics mine) (Kates & Lesser, 1985, p. 418), and (2) "to expand the residents' concept of teaching" (italics mine) (Medio, et al., 1988, p. 214). Finally, one study (Edwards, et al., 1988b) had increased self-confidence in teaching (cf., teaching self-efficacy) as a program goal.
Methodology

It is beyond the scope of this dissertation to discuss the methodologic flaws of the studies reviewed. The patient-centred pace of hospital practice and postgraduate medical training make it difficult to run educational experiments in this context. The authors of the reviewed studies should be commended for their efforts and innovative attempts to pose and answer questions. Of the 22 database entries, 19 are case studies. Two of these make an attempt at an experimental design: “quasi-experimental” (Snell, 1989), and “case-control, pre- and post-observation” (Medio, et al., 1988). Both of these studies used residents who did not attend the TEP as a comparison (i.e., control) group. The mere fact that they did not choose to attend makes them different; any differences found between the two groups may just as likely be attributed to the characteristics of the individuals in the respective groups as to the intervention (i.e., TEP). Conclusion from these studies should be interpreted with caution. One of the database references is a simple program description with study results reported elsewhere. The remaining two studies (one of which is reported three times) (Edwards, et al., 1988a; Greenberg, et al., 1984; Greenberg, et al., 1988; Jewett, et al., 1982) have a randomized case control design. Both have a relatively small total number of study subjects, 22 and
Overall, an attempt was made to use instructional methods that actively involve residents. For the most part, however, this simply meant having residents take part in group discussions (cf., authentic activities e.g., Collins, et al., 1991). Lave and Wenger (1991), in their discussion of discourse and practice, stress the important differences “between talking about a practice from outside and talking within it” (p. 107). They argue “that for newcomers then the purpose is not to learn from talk as a substitute for legitimate peripheral participation; it is to learn to talk as a key to legitimate peripheral participation” (original emphasis) (p. 109). As discussed in an earlier section of this chapter, Lave and Wenger (1991) distinguish between a learning curriculum consisting of situated opportunities and a teaching curriculum constructed for instruction. From their perspective, then, learning becomes a question of access to legitimate practice as a learning resource rather than providing instruction. Most of the programs described, it seems, have little grounding in a social / situated perspective of adult education. A few studies, however, did attempt to
emphasize the important role of experience as part of the TEP: microteaching, with and without video playback (Lawson & Harvill, 1980; Medio, et al., 1988; Pristach, et al., 1991; Snell, 1989), and role playing (Edwards, et al., 1988b; Sobral, 1989).

Timeline

In Jarvis’ (1992) discussion of learning in the workplace, he reminds us “that there are two basic forms of experience: primary and secondary experience. The former involves the actual experience people have in a given situation; this type of experience moulds their self-identity to a great extent. The latter involves experiences in which interaction or teaching occurs over and above the primary experience” (p. 108-181). Although microteaching and role playing may be (or come close to being) authentic activities, they would still be classified as secondary experiences from Jarvis’ point of view. It must be remembered that whether or not residency programs decide to develop and implement TEPs, residents will still have major teaching obligations (and opportunities). Most programs did not take specific advantage of residents’ current teaching assignments as a learning resource. One program (Snell, 1989) did mention that residents had “an opportunity to practice the (newly learned teaching) skills on
the wards during the weeks between sessions” (italics mine) (p. 125). Another program, consisting of two three-hour workshops, separated both workshops by 5 months so that “the experimental group had an opportunity to apply these (teaching) skills in their daily activities” (italics mine) (p. 361). Unfortunately, without structure and follow-up, students (including residents) do not always take advantage of opportunities. None of the programs specifically structured and included such learning activities.

The first decision when deciding on a timeline for a program is deciding whether to offer a “one-shot” or a longitudinal experience. A second decision also involves timing: should residents take part in a TEP only while they have teaching responsibilities? A program based on a longitudinal experience while residents have teaching responsibilities can take advantage of Jarvis’ so-called primary experiences. The program developed as part of this dissertation was specifically designed with these ideas in mind and included a “Task for the Week” between sessions (see chapter three). A teaching “task” was assigned at the end of the each seminar based on that seminar’s content. A lab-coat pocket sized reminder card was handed out to residents. The task became the focus of a reflection (and review) exercise at the beginning of the next weekly session.
Of interest, none of the studies were specifically designed to measure the impact of a teaching responsibility itself on outcomes measures. This is one of the research questions addressed by this dissertation.

In those studies commenting on timeline, about half provided a longitudinal experience while the other half offered a "one-shot" exposure (e.g., 7 hour "Teachathon" (Maxmen, 1980)).

Content

Program content, where provided, variably included the following topics: (1) theories / models of teaching, (2) theories / models of learning, (3) large group teaching / lecturing, (4) small group teaching / discussion, (5) one-on-one teaching, (6) bedside teaching, and (7) evaluation / feedback.

Program Evaluation

All programs were rated favourably; there was a high degree of satisfaction with both instruction and content. Residents considered the experience valuable and useful.
Study Results

Impact of resident TEPs.

All but one of the studies designed to investigate the impact of resident TEP demonstrated a positive effect. Brown (1971) used a pre- and post- 50 item multiple choice test to assess changes in residents' knowledge of teaching and learning. No significant difference was found at the 0.05 level (i.e., mean 24.0 vs. 24.7). On the other hand, Edwards, Kissling, Plauche, & Marier (1986) report that after one year, 67% of residents could still recall specific points presented, and 61% reported using ideas from the course in their teaching. Overall, knowledge was not an important outcomes measure in the studies reviewed.

Improvements in teaching behaviours have been the main focus of most studies assessing outcomes. Sources of perceptions have included residents (i.e., self), students, peers (i.e., other residents and faculty), as well as professional educators. Improvements in self-concept and self-reported behaviours were demonstrated in four studies (Bing-You & Greenberg, 1990; Edwards, et al., 1986; Edwards, et al., 1988; Snell, 1989). Student ratings of residents who attended a teaching skills workshop were significantly higher (p<0.05) on
four of nine dimensions including "overall teaching effectiveness" (Edwards, et al., 1988). In another study (Edwards, et al., 1986) an attempt was made to study the effect of a resident TEP on student ratings of resident teaching; unfortunately, the data was too "scanty" to be interpreted validly.

Improvements in resident teaching behaviours have also been studied by observation methods. One study (Camp & Hoban, 1988; Camp, et al., 1985) used direct informal observation of resident teaching by educators to assess change. Faculty observers "believed that the participants showed that they had put into practice many of the skills that had been discussed and demonstrated in the course on teaching..." (p. 212). More formal attempts to observe and measure changes in resident teaching behaviours, using observation instruments, exist. A case-control pre- and post-observation study (Medio, et al., 1988) demonstrated an improvement in the "treatment" group as compared to "controls." Each resident (6 treatment and 6 controls) was observed during one work round while reviewing an average of ten patients. Unfortunately, the small sample size, and the fact that "controls" consisted of residents not participating in the program (i.e., non-random) make interpretation of the results difficult. Snell (1989), using a similar experimental design with 9 subjects and 5 controls
showed that post-intervention scores increased in all three areas measured (i.e., lecture, tutorial, and discussion ($p < 0.05$)). Observation studies using videotaped resident teaching also demonstrated a positive impact of TEPs on teaching behaviours (Bing-You, 1990; Edwards, et al., 1988a; Greenberg, et al., 1984; Greenberg, et al., 1988; Jewett, et al., 1982; Lawson & Harvill, 1980).

Need for reinforcement / long term effect.

How long are improvements in teaching skills maintained after a TEP? One group of investigators (Edwards, et al., 1988a) noted that improvement in residents' skills (videotaped teaching) had declined when measures were repeated six months later; ratings were, however, still higher than pre-instruction. The authors suggest that residents may need periodic short "refresher" courses to reinforce teaching skills throughout their residency. Of interest, another study (Edwards, et al., 1986) using the same TEP found that post course improvements in self-rated teaching skills "endured without decay for at least a year and a half" (p. 970). Furthermore, "residents could still recall and explain major teaching points and reported that they had used these teaching points 18 months after the course" (p. 970). Similarly, Snell (1989) found that increased ratings of
teaching behaviours (based on observations) were maintained for eight months after a TEP. Overall, little is known about the rate of "decay" of residents' teaching skills after a TEP. An interesting, and unanswered, question is whether or not focusing on "attitude" and "self-efficacy" (cf., specific teaching behaviours) has any effect on the rate of decay.

"Confidence" / self-efficacy.

Although the construct of self-efficacy has not specifically been used as an outcomes measure, self-reported "self-confidence" has. Interestingly, those studies assessing changes in self-confidence did not seek to demonstrate an association with changes in teaching behaviours. Further, the impact of a teaching assignment itself (i.e., experience) on self-confidence has not been explicitly addressed. All three of these issues are specifically addressed in the study described in this dissertation.

Snell (1989) measured self-confidence pre- and post-course by self assessment questionnaire. Significant increases in "confidence in teaching" were found in the treatment group (p < 0.05). Snell goes on to comment that "eight months after the course, the residents all thought that they were more
confident in their teaching” (p. 126). Unfortunately, the data is not presented nor is the analysis. Also, no mention of “control” group comparison is made.

Bing-You and Greenberg (1990) assessed residents’ confidence as teachers and perceptions toward teaching using a pre-workshop questionnaire. However, no post-workshop questionnaire was given; therefore, no comment on the impact of the TEP on self-confidence can be made. At the beginning of the program, 25% of residents felt confident or very confident as teachers (68% somewhat confident, and 7% not confident). Perceived feedback of their teaching was similar to confidence levels, with 32% reporting positive or very positive feedback.

Bing-You (1990) used a pre- and post-workshop questionnaire to assess residents’ “attitude towards teaching.” In addition, trained raters assessed videotapes of resident teaching at the end of the workshop and again at a mean of 6.3 months later (2-11 months). However, no inferences can be made regarding the relationship between teaching attitude and teaching behaviours given the two different study designs for each outcomes measure (i.e., pre-post vs. immediate and delayed post). After the workshop, both residents and interns rated themselves as more effective (p < 0.05) as teachers in
the area of knowledge (using references) but only the interns felt more effective in their technical skills (p < 0.01). Without direct access to the questionnaire items, it is difficult to determine whether "use of references" and "technical skills" represent attitude or self-reported behaviours.

The most interesting and best designed of the studies looking at self-confidence has been reported three times (Greenberg, et al., 1984; Greenberg, et al., 1988; Jewett, et al., 1982). The investigators used a pre-test / post-test control design to study the impact of the workshops: random assignment of 27 in the experimental group attended workshop and consultation sessions; 26 in the control group had no intervention. Three outcomes measures were assessed: (1) self-assessment: pre- & post-questionnaires assessing residents' teaching attitude and perceptions of teaching, (2) peer, student, and faculty evaluation of resident teaching, and (3) videotaped sessions of resident teaching were analyzed by nonphysicians using an instrument deigned to categorize residents' behaviour every 3 seconds.

Forty-nine of the 53 residents completed both self-assessment questionnaires: 18% of residents were "confident" or "very confident" as teachers at beginning of study. After the course, 42% of the experimental group and 22% of the control group
(p < 0.05) were “confident” or “very confident” as teachers. Also, 87% of experimental group felt their teaching skills were improving (vs. 52% control).

After the course, faculty, students, and peers rated 52% of experimental residents as “effective” (vs. 27% of controls; approaching statistical significance). No attempt was made to demonstrate an association of change in attitude with a change in behaviour.

The authors report that “a number of significant correlations were found between the confidence of residents in both groups (experimental and control) as teachers and their perceptions of teaching as a responsibility” (p. 362). Perception of teaching as a responsibility was divided into 4 categories: (1) attitude towards teaching, (2) their role as a teacher, (3) teaching methods, and (4) improving clinical teaching. The range of reported correlation coefficients (absolute value) was 0.26-0.58. If “confidence as a teacher” is accepted as a measure of teaching self-efficacy, it can be assumed that this one item measure of degree of “confidence as a teacher” using a Likert scale is neither as valid nor as reliable as a multi-item scale assessing the same construct. Therefore, one can postulate that the “confidence as a teacher” item in this study is a generic or global (albeit
imperfect) measure of teaching self-efficacy. Of interest, many of the items in Greenberg, Goldberg, and Jewett’s (1984) instrument assessing residents’ perception of teaching responsibility could arguably be said to assess the various dimensions of teaching self-efficacy as described by Ashton (1984). For instance, “Teaching medical students is one of the primary responsibilities of the resident” (p. 362) corresponds with the dimension of “Personal Responsibility for Student Learning” (p. 29) of Ashton’s eight dimensions of teaching self-efficacy. It is not surprising, therefore, to find so many (and statistically significant) correlations between “confidence as a teacher” and perceptions of teaching as a responsibility. Most of the items in the perceptions of teaching as a responsibility simply tap the various dimensions of teaching self-efficacy. Further support for this argument will unfold in the methods and results chapters of this dissertation, as many of the items from Greenberg, Goldberg, and Jewett’s (1984) instrument assessing residents’ perception of teaching responsibility were incorporated into the dissertation’s study instrument where good internal consistency reliability was found.
Importance of attitude.

Lawson and Harvill (1980) comment that most residents have no prior training in teaching skills, and that many are unconvinced of the benefits of taking part in a resident TEP. They argue that, “changing such negative attitude should be a primary goal of a teaching skills program” (p. 1004). Using an end of program questionnaire, the authors assessed residents’ “attitude toward participating in a teaching skills program” (p. 1002). Residents were asked to rate their attitude (very negative, negative, indifferent, positive, very positive) post-program and pre-program (retrospectively) at the same time. Residents’ initial attitude (as assessed retrospectively) towards participating in a TEP were distributed as follows (n=14): 2 very(-); 4 (-); 5 indifferent; 3 (+); 0 very(+). Attitude improved after taking part in the TEP: 0 very(-); 2 (-); 0 indifferent; 7 (+); 5 very(+). Therefore, three maintained the same attitude while 11 became more positive (p < 0.001).
CHAPTER THREE: METHODS

Overview / Introduction

This research study reports the development, implementation, and evaluation of a Teacher Education Program (TEP), and examines its impact on internal medicine residents, more specifically, on residents' (1) sense of teaching self-efficacy, (2) self-reported teaching behaviours, (3) beliefs about teaching, and (4) interest in teaching.

A quasi-experimental design was used and assignment of subjects (i.e., residents) was based on the existing Clinical Teaching Unit (CTU) rotation schedule. A needs assessment was carried out on the control group (n=8) over the course of two rotations, the results of which are reported elsewhere (Arseneau, 1993). The content of the TEP was developed to meet residents' needs as determined by the needs assessment, as well as a review of the literature. Theoretical guidelines for program development were based on several perspectives of adult education, and psychology (see chapter two). Most importantly, teaching self-efficacy was used as a motivational paradigm (Ashton, 1984), and was the main outcomes measure. The treatment group (n=11) attended weekly one
hour seminars longitudinally over the course of their CTU rotation (for a total of five or six sessions). The program was run a total of three times over the course of three rotations.

Using the same categories used to describe and analyze the reports of resident TEPs in the literature (see chapter two), a brief program description is provided.

Workshop participants:
- CTU residents (PGY 2 or PGY 3)
- two groups of 4 and one group of 3 (total 11)

Participation:
- voluntary

Goals:
1. Attitude (major emphasis)
   - enhance residents' perception of teaching self-efficacy
   - enhance residents' perception of teaching responsibility
   - assist residents in conceptualizing their role as teachers
   - enable residents to set teaching goals
   - facilitate the application of residents' teaching goals

2. Reflection-on-action / reflection-in-action (major emphasis)
   - promote resident reflection on teaching
-promote resident reflection while teaching

3. Knowledge & Skills (minor emphasis)
-help residents develop the knowledge and skills to become more effective teachers

Instructor: Ric Arseneau, MD, FRCPC

Time line: 1 hour per week for 6 of 8 weeks

Format:
-multicomponent workshop format
-up to 4 residents at one time
-appeal to adult learner
-minimize technical jargon
-practical
-no reading assignments

Major breakdown of each session:
1. at the end of each session, one or more “tasks” is assigned to the residents (e.g., a formal feedback session with students)
2. the subsequent session began by reviewing the assigned task(s) with a reflection exercise
3. this was followed by presentation / discussion of new material and microteaching / role playing / practice
opportunities for residents, with instructor and peer feedback on performance

4. based on the new material, tasks were assigned to be reviewed the following week

Content

Session 1 - Introduction: Teaching & Learning
Session 2 - Work Rounds & One Minute Teaching Skills
Session 3 - Feedback & Evaluation
Session 4 - Questioning & Non-Facilitating Teaching Behaviours
Session 5 - Cognitive Learning Principles & Problem Solving
Session 6 - Small Group Teaching

Handouts:
- although there were no reading assignment, a one page tri-fold pamphlet (that fits easily into residents' lab coat pockets) was provided for each session
- the front cover listed the tasks for the week
- the body copy contained a synopsis of the session

Program evaluation:
program satisfaction questionnaire
Rationale for Study Design

Before outlining the rationale for the study design, the reader is reminded of the research questions:

1. What attitude do general internal medicine residents have towards teaching (i.e., self-efficacy, beliefs about teaching, and interest in teaching)?

2. What is the effect of a CTU rotation and associated teaching responsibilities on residents' sense of teaching self-efficacy, self-reported teaching behaviours, beliefs about teaching, and interest in teaching?

3. What is the impact of a TEP on residents' sense of teaching self-efficacy, self-reported teaching behaviours, beliefs about teaching, and interest in teaching?

4. Is a change in self-efficacy (i.e., attitude subconstruct) associated with a change in self-reported teaching behaviours?

The four research questions were addressed in the following way:
Question 1:
The instrument was administered to all residents (i.e., control and treatment groups) at baseline; information about teaching self-efficacy, beliefs about teaching, and interest in teaching was collected.

Question 2:
The research instrument was administered at the beginning and again at the end of the CTU rotation, while residents had major teaching responsibilities (i.e., control group). Data on teaching self-efficacy, self-reported teaching behaviours, beliefs about teaching, and interest in teaching was collected. A pre- / post- difference was sought.

Question 3:
The same instrument was administered pre- and post- the TEP (i.e., treatment group). Again, a pre- / post- difference was sought.

Question 4:
Data from questions 2 and 3 was further analyzed looking for an association between self-efficacy and self-reported behaviour.

The study used an experimental research design. It cannot,
however, be described as a “true” experimental design since subjects were not randomly assigned to the control and treatment group. The quasi-experimental design approximates a true experiment. Convenience sampling was used and based on the existing CTU rotation schedule. Residents assigned to do CTU in Sept-Oct 1992, and Nov-Dec 1992 made up the control group (n=8); residents assigned to do CTU in Jan-Feb 1993, Mar-Apr 1993, and Jul-Aug 1993 made up the treatment group (n=11). Although assignment to control and treatment groups was not random, this study design approximates probabilistic sampling in that residents are randomly assigned to the CTU schedule.

Control group
convenience sampling based on CTU rotation schedule
senior resident (i.e., PGY 2 or 3)
participation voluntary (100% participation)
4 residents, Sept-Oct 1992
4 residents, Nov-Dec 1992
total n=8
pre- and post- CTU instrument administration
no intervention (i.e., did not participate in resident TEP)

Treatment group
convenience sampling based on CTU rotation schedule
senior resident (i.e., PGY 2 or 3)
participation voluntary (100% participation, although one resident attended only 3 of 6 sessions)
4 residents, Jan-Feb 1993
4 residents, Mar-Apr 1993
3 residents, Jul-Aug 1993 (one resident had already participated earlier)
total n=11
intervention: resident TEP consisting of 5 or 6 weekly one hour sessions
pre- and post- TEP instrument administration

Instrument

Rationale

This section discusses the development of the instrument to measure the impact of the TEP. It is a self-report, pencil and paper, instrument intended to measure residents' attitude towards teaching, and self-reported teaching behaviours. The word "attitude" will be used broadly to describe all objectives that have to do with affect, feelings, values, and beliefs (Henerson, Morris, & Fitz-Gibbon, 1987). Henerson, Morris, and Fitz-Gibbon (1987) comment on the problems unique to
measuring attitude and remark that “attempting to demonstrate attitude change ...is probably the most difficult of all evaluation tasks” (original emphasis) (p. 11). First of all, attitude is an abstract concept (i.e., a construct) and not a “real” thing that lends itself easily to measurement. Gould (1981), in his book, The Mismeasure of Man, warns of the potential detrimental consequences of reification (and measurement) of abstract concepts. Attitude is not something that can be measured like someone’s height. We can only infer people’s attitude by what they say and do. In fact, attitude is usually defined in terms of behaviour. Gagne (1978), in his discussion of attitude as learning outcomes, describes attitude as “internal states that influence the individual’s choices of action ” (original emphasis) (p. 231). He cautions, however, that attitude does not determine behaviours, but only makes them more likely. Another problem is that people don’t always say what they truly believe for fear of looking bad. However, unless there is reason to believe that the truth will be concealed, what people say probably most accurately reflects their attitude. According to Henerson, Morris, and Fitz-Gibbon (1987), “self-report procedures represent the most direct type of attitude assessment and should probably be employed unless you have reason to believe that the people whose attitude you are investigating are unable or unwilling to provide the necessary
Another problem with measuring attitude, is that they often represent complex multidimension concepts. Ghiselli, Campbell, and Zedeck (1981) discuss the problems in measuring multidimension constructs and the content validity of the instrument used to measure them. On one hand, item homogeneity (i.e., high positive correlations between items) suggests that the items are tapping the same trait. However, this may lead to an instrument that does not cover all aspects of the construct being measured. Teaching attitude (or attitude towards teaching) is a very complex construct. The reader is reminded that teaching self-efficacy, a subcomponent of the construct, was found to have eight dimensions itself (Ashton, 1984). Therefore, for the purpose of this study, no attempt was made to assess teaching attitude comprehensively. Only those aspects of immediate interest to the study were included in the instrument: residents’ sense of teaching self-efficacy, beliefs about teaching, and interest in teaching.

The final instrument used for the study (see Appendix A) included three sections on attitude and one section on self-reported teaching behaviours.
The word “attitude” has been used as a catch all in studies of resident teaching. One study (Skeff, Campbell, Stratos, Jones, & Cooke, 1984) defined it as: a desire to evaluate and improve teaching; satisfaction with teaching, enthusiasm for teaching, awareness of teaching strengths, and awareness of teaching problems. Bing-You and Harvey (1991) studied the relationship between residents attitude (as measured by a questionnaire) and student ratings of the residents' teaching skills. The authors comment that they have included two questions “to measure a teacher's sense of self-efficacy defined by Ashton (1984)” (p.96). Interestingly, several other items from their questionnaire could be interpreted as measuring self-efficacy. No attempt was made to group these items into a “self-efficacy scale.” Like other investigators, the attitude items of the questionnaire included a mixture of perception, self-reported behaviour, interest, and enjoyment. Another study (Greenberg, Goldberg, & Jewett, 1984) defined teaching attitude more broadly. Part of the study looked for correlations between “confidence as a teacher” and perceptions of teaching as a responsibility (i.e., attitude). The
authors report that “a number of significant correlations were found between the confidence of residents in both groups (experimental and control) as teachers and their perceptions of teaching as a responsibility” (p. 362). Perception of teaching as a responsibility was divided into 4 categories: (1) attitude towards teaching, (2) their role as a teacher, (3) teaching methods, and (4) improving clinical teaching. The range of reported correlation coefficients (absolute value) was 0.26-0.58. If the response to the item “confidence as a teacher” is accepted as a measure of teaching self-efficacy, it can be assumed that this one item measure of degree of “confidence as a teacher” using a Likert scale is neither as valid nor as reliable as a multi-item scale assessing the same construct. Therefore, one can postulate that the “confidence as a teacher” item in this study is a generic or global (albeit imperfect) measure of teaching self-efficacy. Of interest, many of the items in Greenberg, Goldberg, and Jewett’s (1984) instrument assessing residents’ perception of teaching responsibility could arguably be said to assess the various dimensions of teaching self-efficacy as described by Ashton (1984). For instance, “Teaching medical students is one of the primary responsibilities of the resident” (p. 362) corresponds with the dimension of “Personal Responsibility for Student Learning” (p. 29) in Ashton’s eight dimensions of teaching self-efficacy. It is not surprising, therefore, to find so many
(and statistically significant) correlations between "confidence as a teacher" and perceptions of teaching as a responsibility. Most of the items from "perceptions of teaching as a responsibility" simply tap the various dimensions of teaching self-efficacy. Further support for this argument will unfold in this section and chapter five (results) of this dissertation, as many of the items from Greenberg, Goldberg, and Jewett's (1984) instrument assessing residents' perception of teaching responsibility were incorporated into the teaching efficacy scale of the instrument being described in this section.

**Instrument Development**

The final instrument (Appendix A) used to measure the outcomes of the TEP for Medical Residents consists of four sections: I. Teaching Scale (self-efficacy), II. Residents as Teachers - Opinion (beliefs about teaching), III. Teaching Skills (self-reported behaviours), and IV. Interest in Teaching. Only the first and third sections (i.e., teaching efficacy and self-reported behaviours) are scales, the development of which is described in detail below. The last two sections (i.e., beliefs about teaching and interest in teaching) are used for descriptive purposes only, and the reader is referred to Appendix A.
Teaching Efficacy

Although no specific instrument exists for the specific needs of the program described below, several items were "borrowed" from the education and medical education literature. The scale was divided into two subscales based on the model of teaching efficacy: A) Teaching efficacy, and B) Personal teaching efficacy (Ashton & Webb, 1986; Bandura, 1977). A matrix was developed, using Ashton's (1984) eight dimensions of self-efficacy, for each subscale. Both positively and negatively worded items were written (or borrowed) for each dimension (and each subscale) using the matrix as a template.

The initial item pool consisted of 8 items on subscale A (teaching efficacy), and 48 items on subscale B (personal teaching efficacy). The items were reviewed with Sue Brigden, M.A. (Ph.D. student, U.B.C.) for clarity and ambiguity. Several items were rewritten. Five new items were written for subscale A (new total = 13) and 22 items were dropped from subscale B (new total = 26).

The items were removed from the matrix, but kept as two subscales, and presented as a forced choice 5 point Likert agreement scale (1=strongly agree; 5=strongly disagree). This initial draft of the instrument was sent to two well know
medical educators: D. Irby, Ph.D., University of Washington, and M. Bergen, Ph.D., Stanford University. Both reviewers have considerable experience with medical education, as well as faculty development. Their suggestions were taken into consideration, and several of the items were reworked. One item was dropped from subscale B. In addition, the Likert scale was reversed (i.e., 1=strongly disagree; 5=strongly agree).

The instrument was then piloted at the Veterans’ Administration Hospital, Seattle, Washington. The pilot group consisted of interns, residents, and faculty (n=22).

Reliability for the two subscales was established using Lertap software, and the Hoyt method of internal consistency. Items with poor loading were removed from each subscale. The final instrument consisted of 6 items from subscale A (teaching efficacy); one item was negatively worded. Subscale B consisted of 12 items (teaching self-efficacy); two items were negatively worded. Items from both subscales were mixed into one section of the final instrument.

Factor analysis was not carried out given the small number of items and the small number of respondents.

Considerable evidence exists for the construct validity of self-
efficacy and was reviewed in chapter two. In order to
demonstrate the validity of the instrument used in this study.
The same questionnaire was sent to 30 members of the
department of medicine, St. Paul's Hospital. The
questionnaires were sent, received, and the data coded and
transcribed by the individual in charge of faculty evaluation
(i.e., the author of the dissertation was blinded in all regards
to provide confidentiality). Information about student ratings
of faculty teaching (i.e., the global assessment item: “Overall
is an effective teacher”) over the past two years was also
provided. Both the teaching efficacy and teaching self-efficacy
subscale scores were correlated with scores on self-reported
behaviours and student teaching evaluations for evidence of
instrument validity.

Self-Reported Teaching Behaviours

The self-reported teaching behaviours scale initially consisted
of 17 items based on the content of the resident TEP and was
developed, reviewed, and piloted as part of the same
questionnaire as teaching efficacy (see above for details).
Upon review 2 questions were thought to be opinions on
teaching and were moved to section II of the final instrument.
Reliability for the scale was established using Lertap software, and the Hoyt method of internal consistency. No items had poor loading, and all were kept in the final instrument.

Data Collection and Analysis

The study (i.e., quasi-experimental study of TEP) collected quantitative data using the instrument described above. The instrument collected data in four categories: (1) teaching self-efficacy, (2) self-reported teaching behaviours, (3) beliefs about teaching, and (4) interest in teaching.

The self-efficacy data consisted of 6 items on the teaching efficacy subscale and 12 items on the teaching self-efficacy subscale. The results are reported as a score on each subscale. Data was collected at the beginning and at the end of the CTU rotation for all groups (i.e., 2 control groups (n=8), and 3 treatment groups of (n=11). Pre- and post- differences were analyzed using a paired t-test. Between group differences (i.e., control vs. treatment) were analyzed by MANOVA.

The self-reported teaching behaviour data consisted of 16 items added into a total score (i.e., a scale). Data was collected at the beginning and again at the end of the CTU rotation.
The end data for the treatment group consisted of two sets of the same 16 items. The first set was the standard pre- and post- items. The second set of the same items formed a “retro” scale, that is a retrospective assessment of self-reported teaching behaviours. The retro-scale allowed residents to reassess their behaviours at the start of the rotation given their more sophisticated understanding of the teaching and learning process. For example, item 3 of this scale asks residents to rate the following statement (1=strongly disagree to 5=strongly agree): I routinely use feedback in student teaching. Beginning residents may rate themselves relatively higher on this scale given their unsophisticated understanding of feedback. After participating in the TEP, which includes instruction-discussion, role-play, and a feedback “Task of the Week,” residents may retrospectively give themselves a lower rating for their feedback efforts at the start of the rotation. Therefore, a retro- / post- comparison may give a more accurate assessment of gains made by participating in the TEP. Both a pre- / post- comparison and a retro- / post- comparison were done. The pre- / post- difference and the retro- / post- difference were analyzed using a paired t-test. Between group differences (i.e., control vs. treatment) were analyzed by MANOVA.

An “intention to treat” analysis was carried out for both of the
above scales. Given that one resident attended only half of the TEP sessions, a decision of whether or not to include the resident in the data analysis needed to be made, as both pre- and post- instrument data was available for this subject. It is likely that this resident differed from the others in some characteristic(s) (e.g., interest in teaching), and therefore, his questionnaire responses were compared to the rest of the group. Interestingly, this is the resident that had a second CTU rotation during the course of the study; therefore, this resident had a second chance to participate in the TEP and make up for the missed sessions but chose not to do so. The data from this resident was included in the analysis as part of the intention to treat analysis (i.e., what are the results when “all comers” are considered?). A second analysis was carried out for the ten residents who participated in all (or most of the study). An arbitrary decision was made at the beginning of the study to consider any resident who had attended more than half of the sessions as having undergone the intervention; residents having attended half, or less than half, of the sessions would not be considered to have undergone the intervention. A few of the residents missed one session; attendance data is available as part of the program evaluation data (see Appendix B). The second analysis was thought to give a better idea of the TEP effect on those who completed the program.
Correlations between changes (i.e., the pre-/post-difference) in the teaching self-efficacy subscale and the self-reported teaching behaviour scale were computed using Pearson’s correlation coefficient to see if changes in teaching self-efficacy were associated with changes in self-reported teaching behaviours.

Beliefs about teaching consisted of 15 items and interest in teaching consisted of 5 items. Neither of these were added to make a scale. Each item was analyzed using descriptive statistics. Pre-/post-differences for both groups were analyzed using a paired t-test. Results for the control group and the treatment group were presented side by side for comparison.

Program Description

Identification of Goals and Objectives

A literature survey of the current status of clinical teaching was undertaken, and a number of medical schools (including our own) having resident or faculty TEPs were contacted and materials were requested (i.e., Harvard Medical School, University of Washington, University of British Columbia
Medical School, Stanford University Medical Centre, Maine Medical Centre, and St. Louis University Medical Centre).

Important sources included those references discussed in chapter two, as well as the following: _Resident Teaching: A Manual to Make it Successful_ (Johnson & First, 1990), _The Role of The Senior Resident: Team Manager, Leader, and Teacher_ (Wipf, 1992), _TIPS: Teaching Improvement Project Systems for Health Care Educators_, _Ward Attending: The Forty Day Month_ (Osborn & Whitman, 1991), _Successful Faculty in Academic Medicine - Essential Skills and How to Acquire Them_ (Bland, Schmitz, Stritter, Henry, & Aluise, 1990), _Clinical Teaching for Medical Residents: Roles, Techniques, and Programs_ (Edwards & Marier, 1988a), _A Practical Guide to Clinical Teaching in Medicine_ (Douglas, Hosokawa, & Lawler, 1988), _Creative Medical Teaching_ (Whitman, 1990), _Residents as Teachers: A Guide to Educational Practice_ (Schwenk & Whitman, 1984), _Preceptors as Teachers_ (Whitman & Schwenk, 1984), _A Handbook for Group Discussion Leaders: Alternatives to Lecturing Medical Students to Death_ (Whitman & Schwenk, 1983), "Feedback in Clinical Medical Education" (Ende, 1983), "Six Common Non-Facilitating Teaching Behaviours" (Napell, 1976). A more important consideration for developing the goals and objectives of the resident TEP was the results of the needs assessment (i.e., participant
observation and structured interviews) conducted on the control and the results of which are reported elsewhere (Arseneau, 1993).

Most of the references in chapter two and those cited above focused more heavily on behavioural objectives and course content. Many ideas and most of the content for the resident TEP were adapted from these sources. However, what most clearly distinguishes the resident TEP discussed below is the process used (cf., content) and the emphasis on non-behavioural objectives. The resident TEP is firmly grounded in four important theoretical concepts discussed in chapter two (i.e., constructivism, situated learning, reflection, and self-efficacy). The rationale for employing these concepts is elaborated in chapter two and will not be repeated here.

Resident TEP: Goals

The goals of the resident TEP were presented in the Introduction / Overview at the beginning of this chapter.
Design of Program and Selection and Development of Content, Process, and Materials

Chapter two introduced four important concepts that run throughout this dissertation: constructivism, situated learning, reflection, and self-efficacy. The resident TEP is firmly grounded in the marriage of these theoretical perspectives. Although one could argue that the overlap between these concepts is what makes for a good marriage. The author of this dissertation contends, that instead, it is the potential synergy between them that underlies the making of a solid foundation for the development of a resident TEP; the total is more than the sum of the individual parts. This will become evident in the detailed discussion of the rationale for the development of two process components of the resident TEP: (1) case studies, and (2) “Task of the Week” (see below). While it is beyond the scope of this dissertation to give a detailed account of the rationale underlying the choice and implementation of all the content and process decisions made for the resident TEP, a detailed account of the case method and a brief account of the “Task of the Week” should provide the reader with a better appreciation of how the author’s choice and understanding of the concepts underlying the grounded theory were translated into practice. Before elaborating on process, however, an overview of the time line,
program format and content will be presented. This section will then close with details of the implementation and evaluation of the program.

Time line

Time line decisions for the program described were deliberate and well thought out, and focused on two important decisions: (1) using a longitudinal program (cf., “one-shot”), and (2) offering the program while residents had a major teaching assignment. The CTU (Clinical Teaching Unit) rotation provides the core program for general internal medicine. This is supplemented by both required and elective rotations in subspecialty medicine (e.g., cardiology). The two month CTU rotations (during PGY 2 and PGY 3) include supervisory and teaching responsibilities with the resident leading a team consisting of one intern (PGY 1) and two MSIs (Medical Student Interns, i.e., final year undergraduate medical students). The resident TEP was, therefore, offered over the course of the CTU rotation.

From an educational perspective (cf., practical or resource) offering the resident TEP during the CTU rotation has several advantages. Given the residents’ supervisory and teaching responsibilities, the content of the program is immediately
relevant, and residents are motivated to participate. This makes good sense from an andragogical perspective (Knowles, 1980). More importantly, it situates learning in legitimate peripheral participation (Lave & Wenger, 1991). From this perspective, it also takes advantage of what Jarvis (1992) describes as "primary experiences" (see Chapter two: Empirical Research on Resident TEPs: Time line). Finally, a longitudinal program offered during a major teaching responsibility allows residents to cultivate the necessary "mastery experiences" that enhance self-efficacy (Bandura, 1977).

In consultation with the Department of Medicine and the Residency Committee, the six sessions of the program were offered on Thursdays from 12:00 to 13:00 (except the last Thursday of each month which is reserved for Morbidity and Mortality Rounds) over the course of each two month rotation for a total of six hours of instruction per group.

Program Format

Based on a review of effective program formats (Skeff, Berman, & Stratos, 1988), a "multicomponent" workshop format was used. Given that there are four CTUs, it was anticipated that
up to four residents would take part in the program at one time. The interest generated by word of mouth, however, lead to a request by residents in subspecialty rotations to participate in the program. One or two residents (per course offering) were thus allowed to take part but were not considered study subjects (except in filling out program evaluation forms).

The program was designed to appeal to adult learners (Knowles, 1980), and the use of technical jargon was kept to a minimum. It was important that residents perceive the program as practical, as well as interesting. Given the multiple and competing demands on residents' time, there were no reading assignments. The author served as instructor for all sessions.

The breakdown of each session followed a similar format consisting of: (1) reviewing and reflecting on the “Task of the Week” assigned in the prior session (except during first session), (2) presentation / discussion of new material, (3) microteaching / role playing / practice opportunities for residents, with instructor and peer feedback on performance, and (4) assignment of the “Tasks for the Week” to be reviewed at the following session
Content

The course content was selected based on an extensive review of the literature including several monographs (see Goals and Objectives above). The results of the needs assessment helped narrow the scope of the course content. Given that St. Paul’s Hospital already had programs designed to help residents develop lecturing and bedside teaching skills (unfortunately, both of which have since been abandoned), these two areas were not addressed in the resident TEP curriculum. For the most part, the program was directed towards the development of teaching skills applicable during residents’ CTU rotation. A detailed outline of each session is provided in Appendix C. The content of each session is briefly outlined below.

Session 1: introduction: teaching & learning.

Introduction
Goals and Objectives for the Program
Course Content
Teaching and Learning
What Makes a Good Teacher?
Residents as Teachers
Learning Environment / Climate
Clinical Teaching Techniques for Residents
Tasks for the Week
Session 2: work rounds & one minute teaching skills.
Review of Last Week's Tasks
Models for Work Rounds
Tips for Running Efficient Work Rounds
Delegating Work
One Minute Teaching Skills During Work Rounds
Microskills Role Play: One Minute Teaching Skills
Tasks for the Week

Session 3: feedback & evaluation.
Review of Last Week's Tasks
Feedback vs. Evaluation
Feedback: The Psychological Meaning
Content of Effective Feedback
Role Play: Evaluation & Feedback
Managing Mistakes
Tasks for the Week

Session 4: questioning & non-facilitating teaching behaviours.
Review of Last Week's Tasks
Introduction
Levels of Questioning - “KAP”: Knowledge, Application, & Psychomotor Skills
Questioning Techniques
Microteaching: Questioning
Six Common Non-Facilitating Teaching Behaviours

Reflection Exercise: Non-Facilitating Teaching Behaviours

Tasks for the Week

Session 5: cognitive learning principles & problem solving.
Review of Last Week's Tasks
Cognitive Learning Principles
Discovery Learning Exercises
Reflection Exercise
Problem Solving Strategies
Tasks for the Week

Session 6: small group teaching.
Review of Last Week's Tasks
Introduction / Setting Objectives
Teacher & Session Characteristics
Group Discussion Teaching Techniques
Managing Group Dynamics
Preparing A Small Group Discussion
Resident TEP Evaluation
The discussion that follows, of the rationale for the development of two process components (i.e., case studies, and "Task of the Week"), will provide the reader with some insight into how the author translated the important theoretical concepts underlying the resident TEP (i.e., constructivism, situated learning, reflection, and self-efficacy) into practice. The author shares Mezirow's (1991) concern for the "disturbing fault line" that separates adult learning theories from practice, and agrees that more effort is needed in synthesizing different theories for use by adult educators; the program described herein is one such effort. Mezirow warns against the misguided use of "theory-in-practice" based on common experience. He contends that "experience has often been predicated upon behaviourist assumptions simply because the behaviourist approach has so many features amenable to bureaucratic control, such as accountability, measurability, and focus on anticipated behavioural outcomes" (p. xi). He criticizes adult educators for ignoring the pre-eminence of meaning "-how it is constructed, validated, and reformulated - and the social conditions that influence the ways in which adults make meaning of their experience "(italics mine) (p. xii). He argues "that it is not so much what happens to people but how they interpret and
explain what happens to them that determines their actions, their hopes, their contentment and emotional well being, and their performance” (p. xiii).

Meaning and constructivism are the foundation on which the resident TEP (and this dissertation) is built. Constructivism is the theme that is woven through the three other important concepts: situated learning, reflection, and self-efficacy. The reader is reminded that residents, in taking part in the TEP, are in fact learners; however, they are learning how to teach, or more importantly, they are learning to facilitate others’ learning. It would be paradoxical, if not ridiculous, to use constructivist principles in the process of educating residents about teaching, without expecting residents to in turn use these same principles in their own teaching. First of all, by using constructivist principles and actively involving residents in the learning process, the author is modelling what he considers to be effective teaching. Secondly, the principles of constructivism are referred to throughout the program, and then formally addressed in Session 5: Cognitive Learning Principles & Problem Solving. Residents “discover” six principles of constructivism by taking part in discovery learning exercises or games. Thereafter, they are asked to reflect on their undergraduate and graduate medical education, and consider two questions: (1) What
circumstances in medical education work for or against effective learning? (2) How can we facilitate effective learning? The content of this session is presented in detail in Appendix C, Session 5. Although the literature on resident TEP warns against presenting anything but practical skills because of poor reception of theoretical material by residents, the author did not heed this advice. In fact, this session proved to be one of the most popular for residents. They commented that it provided "insight into learning" and they recommended that this session should definitely be kept in the program. The authors' views and approach are consistent with those expressed by Bowden (1988). Bowden proposes that achieving change in teaching requires changing teachers' conceptions of themselves as teachers, of the role of students, and of what it means to learn. He draws a distinction between teachers' "espoused theory" and "theory-in-use" of teaching (p. 256). He contends that "the problem lies in a mismatch between espoused theory and the way students are actually taught and assessed" (p. 258). He warns that it is possible to teach (and assess) students in ways which unintentionally promote simple recall rather than higher level aims. As one solution to this problem, he proposes helping bridge the gap between teachers' espoused theories and their theories-in-action. To this end, he proposes helping teachers change their conception of teaching. Teachers' focus should be probing
students’ understanding of material and helping them modify unsophisticated concepts (or misconceptions). He emphasizes that “there is no point in merely informing teachers of general principles they should adopt, principles that would be largely content-free and meant to apply to all context” (p. 259). He argues that “we need, therefore, to create an opportunity for teachers to develop an understanding of what those processes involve and for them to discover actively the ways in which they might apply to their own disciplines” (italics mine) (p. 259).

Although the constructivist perspective underlies the whole of the resident TEP, the case studies and the “Tasks for the Week” illustrate the so-called marriage of constructivism with situated learning, reflection, and self-efficacy. These will now be considered in turn.

Case method.

Judith Shulman (1992a), in her book, Case Methods in Teacher Education, expresses concern about the gap that exists between the complexity of real world teaching and the “theoretical principles taught as quasi-prescriptions” in TEPs (p. xiii). She proposes using case studies in an attempt to
bridge the gap between theory and practice. She sees cases as controllable reality offering a more vivid context than textbook discussions, and yet being more manageable (and less threatening) than real world experience to newcomers. Shulman cites the recommendations of the landmark report by the Carnegie Task Force on Teaching as a Profession (1986) that “teaching ‘cases’ illustrating a great variety of teaching problems should be developed as a major focus of instruction” (p. xiv). She contends that cases offer a means of providing situated knowledge (see discussion in chapter two) and an opportunity to analyze ill-structured problems (cf., Schon’s “swamp”, 1987) where there is no one right answer. Finally, she comments on the use of cases as a stimulus for reflection. Cases “stimulate teachers’ individual reflection on their own teaching, as well as providing a basis for dialogue and interaction among teachers themselves” (p. xv). The reader is also reminded of the four sources of efficacy expectations as discussed in chapter two: (1) performance accomplishments, (2) vicarious experience, (3) verbal persuasion, and (4) emotional arousal (Bandura, 1986). Case discussions by residents may enhance perceived teaching self-efficacy through vicarious experience and verbal persuasion. Kleinfeld (1992) also supports the notion that “cases...give the student a great deal of vicarious experience” (p. 34). It is her position that the major role of TEPs is to teach students “how to ‘think
like a teacher,' that is, learn how to formulate educational problems, design strategies that fit specific (situations), and reflect on the ethical and policy issues as well on the pedagogical issues embedded in everyday instructional decisions” (p. 34). She uses a case to illustrate how the case method can provide: (1) *Vicarious experience* with the kinds of problematic situations characteristic of teaching; (2) A model of how an expert teacher goes about *framing* and *constructing* educational problems; (3) A model of how a sophisticated teacher inquires about and *reflects* on such problems; (4) A stock of educational strategies for use in analogous problem situations; and (5) A sense that teaching is an inherently ambiguous activity requiring continuous *reflection* (italics mine) (p. 34-35). Case studies, therefore, establish a means of “marrying” the four important concepts underlying the grounded theory of the resident TEP: constructivism, situated learning, reflection, and self-efficacy.

Lee Shulman (1992b) discusses five situations in which cases and case methods are particularly appropriate: (1) theoretical principles (i.e., offering theoretical explanations for courses of action); (2) precedents for practice (i.e., prototypical cases may be guides for future actions); (3) moral or ethical principles (i.e., provide clear models of worthy attitude and behaviours); (4) strategies, dispositions,
reflection, and habits of mind (i.e., provide opportunities for newcomers to "think like a teacher"); and (5) visions or images of the possible. Furthermore, cases may motivate and stimulate interest. Shulman reports "the growing feeling among teacher educators that while the average teacher could hardly be characterized as reflective, the image of reflective practice corresponds to the most desirable vision of proper pedagogy" (p. 8). She argues that "cases provide occasions for professionals to gather together for retelling, reflection, and analysis" (p. 10), and cites case conferences in medicine as one prototype. The author of this dissertation is more than familiar with this "prototype," and would argue, in fact, that it is not one prototype. Several different approaches to case conferences exist. The reader is also cautioned not to equate case methods with discussion or reflection, as this author is familiar with many examples of the case conference in medicine where an opportunity for neither is provided. Schwab (1964, cited in Shulman, 1992b) suggests that case discussion should occur on two distinct layers. The first layer deals with the content of the case itself and a discussion of alternative interpretations. The second layer is reflexive; students reflect on their own understanding and analysis. These two layers are not necessarily dealt with in succession, as the movement between the first layer (i.e., cognition) and the second layer (i.e., metacognition) is usually iterative.
The narratives of the cases used in the resident TEP are situated in real stories collected by the author of this dissertation; they reflect the social and cultural context within which residents are expected to teach. This may reduce the problem of transfer from the seminar room to actual teaching on the wards by residents, as residents “may find it far easier to remember and use ideas that are located in the narrative form of cases” (Shulman, 1992b, p. 24). The cases used for the resident TEP can be found in the outlines of session content (Appendix C). One example is provided, here, for the reader:

RF is an R2 in medicine. She is scheduled for a CTU rotation at St. Paul’s Hospital. She looks forward to her new role as team leader and teacher. In fact, she spends many hours preparing small “talks” for the juniors before starting the rotation.

Her intern and MSI are particularly strong academically. During the first week she gives one of her mini lectures - nephrotic syndrome - with well prepared overheads. She senses that the juniors are not very interested. She concludes that the juniors are not motivated and decides not to give any more talks.
As the rotation proceeds a power struggle develops between RF and the juniors. She tries to maintain control of the team, and to teach by imparting information and her opinions on patient management. The juniors see her as controlling and overbearing.

What went wrong?

During the discussion, residents are first asked to frame the problem, and offer possible solutions. Next, they are forced to reflect on the assumptions underlying their frames of reference and solutions. Considerable emphasis is placed on seeing alternate frames and solutions.

“Tasks for the Week.”

“Tasks for the Week” were assigned at the end of each of the first five sessions (i.e., briefing); they provided a brief review of and closure for each session. Residents received a one page tri-fold pamphlet containing a review of the session (see Appendix D). The front flap of the pamphlet listed the tasks and provided the residents with a “reminder.” Residents were expected to perform the tasks during the week until the next session. The beginning of the next session began by
debriefing residents on their performance of the tasks; this provided a review of the material and an opportunity for reflection. Residents gave brief accounts of performing the task. They were prompted to provide their "reflection-in-action" at the time. The ensuing group discussion provided an opportunity for "reflection-on-reflection-in-action" (sic). Greater emphasis was placed on the positive aspect of accounts in order to promote perceived self-efficacy. When accounts were mostly negative, residents were asked to come up with more useful alternatives.

Pearson (1985) discusses the central role of debriefing in experience-based learning. He states that "through each experience we may gain new understandings and skill, and our beliefs about ourselves, others and the world are challenged, changed or reinforced" (p. 69). He cautions, however, that "simply to experience...is not enough. Often we are so deeply involved in the experience itself that we are unable, or do not have the opportunity, to step back from it and reflect upon what we are doing in any critical way" (p. 69). He traces the historical roots of debriefing to the military where participants of campaigns and war games were asked to account for their actions, and to develop new strategies as a result of the experience. He suggest three questions (i.e., steps) in the debriefing process: (1) What happened? (2) How did the
participant feel? (3) What does it mean? He argues that “reflection lies at the core of experience-based learning. Without it, experiences may remain as experiences and the full potential for learning by the participant may not be realized” (p. 83). He outlines “rules” for effective debriefing: (1) a positive commitment to debriefing, (2) the deliberate planning of debriefing, (3) briefing (i.e., establishing clear objectives, and purposes for the activities), and (4) a positive debriefing “environment.”

A review of the "Tasks for the Week" is available from the resident TEP handouts (Appendix D).

The main reason for developing the “Tasks for the Week” was to allow residents to cultivate mastery experience and thereby, enhance their sense of teaching self-efficacy (i.e., the major outcomes measure of this study). Beyond this, the situated nature of these exercises in authentic activity provided residents with primary experiences (Jarvis, 1992) to complement the secondary experiences provided by the TEP. These tasks can be seen to occupy the centre of what Wenger and Lave (1991) describe as legitimate peripheral participation, as the residents have moved to “legitimate participation.”
The above discussion provides yet another example of the happy marriage of constructivism, situated learning, reflection, and self-efficacy.

Several other processes are used throughout the resident TEP (e.g., brainstorming, microteaching, role-playing). Others were specifically designed for use in the program described. A detailed account of all of these can be gleaned by reviewing the content of each session provided in Appendix C (see TASK). It is beyond the scope of this dissertation to give a detailed account of the rationale for choosing or designing each and every one of these; this would be tedious and redundant as the discussion of the case method and the “Task for the Week” were designed with the same ideas in mind.

Materials

Although no readings were assigned, one photocopied reference was provided: “Clinical Teaching Techniques for Residents” (Edwards & Marier, 1988b). Also, a one page tri-fold pamphlet (that fit easily into residents’ lab coat pockets), was provided for each session. The front cover of the pamphlet listed the tasks for the week; the body copy
contained a synopsis of the session. The only other materials included the Department of Medicine resident teaching evaluation form (i.e., student rating form of resident teaching) and a "12 Steps of Effective Feedback" checklist (all of the above materials are available in Appendix D).

Implementation

Beginning in January 1993, the resident TEP was offered to CTU residents at St. Paul's Hospital, University of British Columbia. The program was offered a total of three times (to date): January-February 1993, March-April 1993, and July-August 1993. The May-June 1993 CTU rotation was skipped because MSIs are absent for three weeks during the month of May. All four CTU residents participated in the first two offerings. During the third offering, one resident who participated in the program previously (4 months earlier) did not take part again. Therefore, a total of 11 CTU residents participated in the resident TEP in three groups over an eight month period. The interest generated by word of mouth, however, lead to a request by residents in subspecialty rotations to participate in the program. One or two residents (per course offering) were thus allowed to take part but were not considered study subjects (except in filling out program
evaluation forms). The author of the dissertation conducted all the sessions.

Program Evaluation

A program satisfaction questionnaire with both quantitative and qualitative questions was completed by participating residents at the end of the TEP. The quality of the program, the quality of the teaching, and the relevance of each session were assessed. A copy of the program evaluation instrument is provided in Appendix B.
CHAPTER FOUR: RESULTS

Introduction

This chapter reviews the results of the study. The results of instrument piloting will be reviewed first. This will be followed by the data analysis of the four parts of the instrument:

I. Teaching Scale (self-efficacy and teaching self-efficacy)
II. Residents as Teachers - Opinion (beliefs about teaching)
III. Teaching Skills (self-reported teaching behaviours)
IV. Interest in Teaching

Finally, the results of the program evaluation will be reported.

Before moving on, however, the reader is reminded of the research questions for this study.

Research Questions

1. What attitude do general internal medicine residents have towards teaching (i.e., self-efficacy, beliefs about teaching, and
interest in teaching)?

2. What is the effect of a CTU rotation and associated teaching responsibilities on residents’ sense of teaching self-efficacy, self-reported teaching behaviours, beliefs about teaching, and interest in teaching?

3. What is the impact of a TEP on residents’ sense of teaching self-efficacy, self-reported teaching behaviours, beliefs about teaching, and interest in teaching?

4. Is a change in self-efficacy (i.e., attitude subconstruct) associated with a change in self-reported teaching behaviours?

Instrument Piloting

The design and development of the study instrument was discussed in detail in chapter three and will not be repeated here.

A copy of the pilot instrument is available in Appendix A. The items with the best “loading” and providing the best internal consistency reliability were kept in the final instrument (see Appendix A).
Item statistics (i.e., “loading”; r) for items used in the final instrument are available in Appendix E.

Below is the final number of items in, and the internal consistency reliability for each scale.

<table>
<thead>
<tr>
<th><strong>INTERNAL CONSISTENCY RELIABILITY OF PILOT INSTRUMENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TE</strong></td>
</tr>
<tr>
<td>Items (n)</td>
</tr>
<tr>
<td>Hoyt (r)</td>
</tr>
</tbody>
</table>

TE = Teaching Efficacy  
TSE = Teaching Self-Efficacy  
SRB = Self-Reported Teaching Behaviours

**Instrument Validation**

Considerable evidence exists for the construct validity of self-efficacy and was reviewed in chapter two. It is beyond the scope of this dissertation to provide extensive construct
validation or instrument validation. However, some evidence of instrument validity was sought by examining the relationship between department of medicine faculty scores on the two teaching efficacy subscales (i.e., teaching efficacy and teaching self-efficacy) and the self-reported teaching behaviour scale. In addition, scores on the two teaching efficacy subscales were correlated with student evaluations of faculty teaching. A global assessment of faculty teaching was provided by using the mean rating on a 5 point Likert scale to the item "Overall is an effective teacher" over a two year period.

The instrument was sent to 30 faculty members of St. Paul's Hospital Department of Medicine. Twenty-five questionnaires were returned for a response rate of 83%. The individual responsible for collecting, analysing, and reporting student evaluations of faculty teaching, provided a mean rating of students' responses to "Overall is an effective teacher." Data from at least 5 students over a two year period was provided for each faculty member. Student rating data and questionnaire responses were blinded in terms of faculty identity to the author of this dissertation. Teaching efficacy and teaching self-efficacy were correlated to self-reported teaching behaviours (SRB) and student ratings using Pearson's correlation.
Pearson’s r

<table>
<thead>
<tr>
<th></th>
<th>TE</th>
<th>TSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRB</td>
<td>0.14</td>
<td>0.57</td>
</tr>
<tr>
<td>Student Ratings</td>
<td>-0.17</td>
<td>0.30</td>
</tr>
</tbody>
</table>

TE = Teaching Efficacy
TSE = Teaching Self-Efficacy
SRB = Self-Reported Teaching Behaviours

The results show little or no correlation between teaching efficacy and self-reported teaching behaviours or student ratings. However, a much stronger correlation was found between teaching self-efficacy and self-reported teaching behaviours or student ratings. This is consistent with the two dimensional model of self-efficacy.

Sections I & III: Self-Efficacy and Self-Reported Behaviour
Scales

This section reports the results of the control (n=8) and treatment (n=11) groups on the self-efficacy and self-reported
behaviour scales. Both scales are 5 point Likert agreement scales: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree. The self-efficacy scale is divided into two subscales. The “teaching efficacy” subscale is composed of 6 items for a possible maximum score of 30. The “teaching self-efficacy” subscale is composed of 12 items for a possible score of 60. The self-reported teaching behaviour scale is composed of 16 items for a possible maximum score of 80. Pre- and post-measurements were made for each scale. In addition, a self-reported behaviour “retro-” measurement was made for the treatment group. Therefore, post-intervention, residents were asked to assess themselves on several teaching behaviours (e.g., “I routinely use feedback in student teaching”). A retro-measurement allowed residents to reassess their behaviour at the beginning of the rotation (cf., pre-) in light of their new understanding of teaching behaviours through participation in the TEP. For example, at the beginning of the program (i.e., pre-), residents may rate themselves highly on the feedback question in the example above. However, through participation in the TEP they may discover that they hold a limited conception of what it means to give feedback and change their behaviour accordingly. At the end of the program, they may then again rate themselves highly on the feedback question. Adding a retro-question may help control for this phenomenon and allow a better
The data analysis is further complicated by the fact that one treatment group participant only attended 3 of the 6 sessions. A decision was made at the onset of the program to consider anyone having completed more than half the program as having undergone the intervention. Therefore, two analyses were carried out for this section, as self-efficacy and self-reported teaching behaviours were the major outcomes measures. An “intention to treat” analysis was carried out using data from all 11 subjects (i.e., all those that agreed to participate). A second analysis was carried out with data from subject #14 removed (i.e., n=10) to assess the outcome for those individuals that completed at least 50% of the program.

Raw data of total scores on the two self-efficacy subscales and the self-reported behaviour scale is available in Appendix F.

**Student t-Tests**

To begin with a paired sample student t-test was done pre- and post- for each scale (the term “scale” will be used to refer to both self-efficacy subscales and the self-reported behaviour
The mean difference refers to the total possible score on the scale (i.e., teaching efficacy=6; teaching self-efficacy=12; self-reported teaching behaviour=16). For instance, the mean difference for teaching efficacy (pre- vs. post-) in the control group is 0.625 out of a possible 6. This represents a difference of approximately 0.1 on a 5 point Likert scale (i.e., 0.625/6=0.1). This very small difference did not achieve statistical significance (p=0.472). Given that each scale had a different total number of items, differences will be reported as a difference on a 5 point Likert scale.

For each scale, a non-paired student t-test was done, comparing the pre- results of both the control and treatment groups, to demonstrate whether the groups were the same at baseline. Groups are considered significantly different at baseline if P < 0.05.

Statistical results for each scale appear on the following pages, the last of which looks at the “retro-” vs. post- self-reported behaviour scale. Results appear twice, both with and without case #14. The results of pre- vs. post- are placed alongside for easy comparison.
Teaching Efficacy (TE)

PAIRED SAMPLES T-TEST 8 CASES
Teaching Efficacy Control Pre- vs. Post-
MEAN DIFFERENCE = 0.625 i.e., 0.1 on a 5 point scale
SD DIFFERENCE = 2.326
P = 0.472

PAIRED SAMPLES T-TEST 11 CASES
Teaching Efficacy Treatment Pre- vs. Post-
MEAN DIFFERENCE = 0.273 i.e., 0.05 on a 5 point scale
SD DIFFERENCE = 3.580
P = 0.806

PAIRED SAMPLES T-TEST 10 CASES (without 14)
Teaching Efficacy Treatment Pre- vs. Post-
MEAN DIFFERENCE = 0.200 i.e., 0.03 on a 5 point scale
SD DIFFERENCE = 3.765
P = 0.870

NON-PAIRED SAMPLES T-TEST 18 CASES
Teaching Efficacy Control Pre- vs. Treatment Pre-
P = 0.540
Teaching Self-Efficacy (TSE)

PAIRED SAMPLES T-TEST 8 CASES
Teaching Self-Efficacy Control Pre- vs. Post-
MEAN DIFFERENCE = 2.625 i.e., 0.2 on a 5 point scale
SD DIFFERENCE = 2.722
P = 0.029

PAIRED SAMPLES T-TEST 11 CASES
Teaching Self-Efficacy Treatment Pre- vs. Post-
MEAN DIFFERENCE = 5.000 i.e., 0.4 on a 5 point scale
SD DIFFERENCE = 5.422
P = 0.012

PAIRED SAMPLES T-TEST 10 CASES (without 14)
Teaching Self-Efficacy Treatment Pre- vs. Post-
MEAN DIFFERENCE = 4.900 i.e., 0.4 on a 5 point scale
SD DIFFERENCE = 5.705
P = 0.024

NON-PAIRED SAMPLES T-TEST 18 CASES
Teaching Self-Efficacy Control Pre- vs. Treatment Pre-
P = 0.547
Self-Reported Teaching Behaviours (SRB)

PAIRED SAMPLES T-TEST 8 CASES
Self-Reported Behaviours Control Pre- vs. Post-
MEAN DIFFERENCE = 2.750 i.e., 0.2 on a 5 point scale
SD DIFFERENCE = 3.808
P = 0.080

PAIRED SAMPLES T-TEST 11 CASES
Self-Reported Behaviours Treatment Pre- vs. Post-
MEAN DIFFERENCE = 10.818 i.e., 0.7 on a 5 point scale
SD DIFFERENCE = 8.658
P = 0.002

PAIRED SAMPLES T-TEST 10 CASES (without 14)
Self-Reported Behaviours Treatment Pre- vs. Post-
MEAN DIFFERENCE = 11.900 i.e., 0.7 on a 5 point scale
SD DIFFERENCE = 8.306
P = 0.001

NON-PAIRED SAMPLES T-TEST 18 CASES
Self-Reported Behaviours Control Pre- vs. Treatment Pre-
P = 0.866
“Retro-”: Self-Reported Teaching Behaviours (SRB)

PAIRED SAMPLES T-TEST 11 CASES
Self-Reported Behaviours Treatment Retro- vs. Post-
MEAN DIFFERENCE = 15.182 i.e., 0.9 on a 5 point scale
SD DIFFERENCE = 10.078
P = 0.001

Self-Reported Behaviours Treatment Pre- vs. Post-
MEAN DIFFERENCE = 10.818 i.e., 0.7 on a 5 point scale
SD DIFFERENCE = 8.658
P = 0.002

PAIRED SAMPLES T-TEST 10 CASES (without 14)
Self-Reported Behaviours Treatment Retro- vs. Post-
MEAN DIFFERENCE = 17.200 i.e., 1.1 on a 5 point scale
SD DIFFERENCE = 7.94145
P = 0.00007

Self-Reported Behaviours Treatment Pre- vs. Post-
MEAN DIFFERENCE = 11.900 i.e., 0.7 on a 5 point scale
SD DIFFERENCE = 8.306
P = 0.001
Teaching Efficacy

Only a small pre- post-difference was demonstrated for teaching efficacy in both the control and treatment groups (0.1 and 0.05 respectively). These differences did not achieve statistical significance (0.472 and 0.870 respectively). Also, there was no significant difference between groups at baseline (p=0.54). Therefore, teaching efficacy remained stable throughout the program. No effect could be demonstrated by participation in a resident TEP or having a CTU teaching assignment.

Teaching Self-Efficacy

The control group had an increase of 0.2 (out of 5) that was statistically significant (p=0.029). The treatment group improvement was twice that of the control group at 0.4 (out of 5)(p=0.012). No significant differences were noted with the removal of case #14. Also, both groups were comparable at baseline (p=0.547). Both a teaching assignment and the resident TEP had a positive impact on residents' sense of teaching self-efficacy, with the TEP effect being twice that of a teaching assignment alone.
Self-Reported Teaching Behaviours

The control group had a small increase of 0.2 (out of 5) that did not achieve statistical significance (p=0.080). In contrast, the treatment group increased by 0.7 (out of 5) and was significant at the 0.002 level. Results were similar with and without case #14. Also, the results indicate that the two groups were the same at baseline (p=0.866). Therefore, the CTU teaching assignment had no significant effect on self-reported teaching behaviours in the control group, whereas, the addition of a resident TEP was related to an improvement of 0.7 (on a 5 point scale) in the treatment group.

A retro-assessment of behaviours at the beginning of the rotation, in light of new insights provided by participating in the TEP, reveal that the improvements in self-reported behaviours for the treatment group may be an underestimate. Using a retro- vs. post-design, the improvements in self-reported teaching behaviours improved from 0.7 to 0.9 (for all cases; n=11; p=0.001) and from 0.7 to 1.1 (case #14 removed; n=10; p=0.00007).
There was good internal consistency reliability for the scales use with all but one result falling into the 0.74 - 0.87 range. Only the Teaching efficacy: Control post- was outside this range at 0.45.

All of the r values appear below.

<table>
<thead>
<tr>
<th></th>
<th>TE</th>
<th>TSE</th>
<th>SRB</th>
<th>SRB-retro</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-</td>
<td>0.87</td>
<td>0.80</td>
<td>0.87</td>
<td></td>
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<tr>
<td>Post-</td>
<td>0.45</td>
<td>0.82</td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-</td>
<td>0.84</td>
<td>0.73</td>
<td>0.84</td>
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<tr>
<td>Post-</td>
<td>0.82</td>
<td>0.83</td>
<td>0.74</td>
<td>0.86</td>
</tr>
</tbody>
</table>

TE = Teaching Efficacy
TSE = Teaching Self -Efficacy
SRB = Self-Reported Teaching Behaviours
MANOVA

Data analysis was repeated using MANOVA to perform a multivariate analysis of variance. Specifically, the following differences were sought: (1) Between Group Difference at Baseline, (2) Pre- vs. Post- Difference, and (3) Treatment vs. Control Difference. Differences were considered significant at the 0.05 level.

Data for each scale is presented in the following pages and includes: Mean (score) pre- and post-, SD (standard deviation) pre- and post-, p values for “Between Group Difference at Baseline”, “Pre- vs. Post- Difference,” and “Treatment vs. Control Difference.” A graphic representation is also included.
Analysis of Variance
MANOVA

TEACHING EFFICACY

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
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<tbody>
<tr>
<td></td>
<td>Pre-</td>
<td>Post-</td>
<td>Pre-</td>
</tr>
<tr>
<td>Treatment</td>
<td>22.9</td>
<td>23.2</td>
<td>3.3</td>
</tr>
<tr>
<td>Control</td>
<td>23.8</td>
<td>24.4</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Between Group Difference at Baseline $p = 0.422$

Pre- vs. Post- Difference $p = 0.545$

Treatment vs. Control Difference $p = 0.811$
Analysis of Variance
MANOVA

**TEACHING SELF-EFFICACY**

<table>
<thead>
<tr>
<th></th>
<th>Mean (Pre)</th>
<th>Mean (Post)</th>
<th>SD (Pre)</th>
<th>SD (Post)</th>
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</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>40.3</td>
<td>45.3</td>
<td>5.2</td>
<td>5.1</td>
<td>11</td>
</tr>
<tr>
<td>Control</td>
<td>41.8</td>
<td>44.4</td>
<td>5.5</td>
<td>4.9</td>
<td>8</td>
</tr>
</tbody>
</table>

Between Group Difference at Baseline $p = 0.895$

Pre- vs. Post- Difference $p = 0.002$

Treatment vs. Control Difference $p = 0.273$

![Teaching Self-Efficacy Graph](image)
Analysis of Variance
MANOVA

SELF-REPORTED BEHAVIOUR

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Pre-</th>
<th>Post-</th>
<th>Pre-</th>
<th>Post-</th>
<th>n</th>
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</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>52.2</td>
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<td>7.0</td>
<td>4.7</td>
<td>11</td>
<td></td>
<td></td>
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<tr>
<td>Control</td>
<td>51.6</td>
<td>54.4</td>
<td>7.7</td>
<td>7.0</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Between Group Difference at Baseline \( p = 0.092 \)

Pre- vs. Post- Difference \( p = 0.001 \)

Treatment vs. Control Difference \( p = 0.025 \)

![Graph showing self-reported behavior over pre and post treatment periods for treatment and control groups.](image)
Analysis of Variance - Subject 14 Removed

MANOVA

TEACHING EFFICACY

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Pre-</td>
<td>Post-</td>
</tr>
<tr>
<td>Treatment</td>
<td>23.5</td>
<td>23.7</td>
</tr>
<tr>
<td>Control</td>
<td>23.8</td>
<td>24.4</td>
</tr>
</tbody>
</table>

Between Group Difference at Baseline \( p = 0.681 \)

Pre- vs. Post- Difference \( p = 0.596 \)

Treatment vs. Control Difference \( p = 0.784 \)

![Graph showing教效能（-#14）](image)
Analysis of Variance - Subject 14 Removed

MANOVA

TEACHING SELF-EFFICACY

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-</td>
<td>Post-</td>
<td>Pre-</td>
</tr>
<tr>
<td>Treatment</td>
<td>41.0</td>
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<tr>
<td>Control</td>
<td>41.8</td>
<td>44.4</td>
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</table>

Between Group Difference at Baseline \( p = 0.857 \)

Pre- vs. Post- Difference \( p = 0.004 \)

Treatment vs. Control Difference \( p = 0.317 \)
Analysis of Variance - Subject 14 Removed

MANOVA

**SELF-REPORTED BEHAVIOUR**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Pre-</th>
<th>Post-</th>
<th>Pre-</th>
<th>Post-</th>
<th>n</th>
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</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>51.5</td>
<td>6.9</td>
<td>63.4</td>
<td>4.7</td>
<td>10</td>
<td></td>
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<tr>
<td>Control</td>
<td>51.6</td>
<td>7.7</td>
<td>54.4</td>
<td>7.0</td>
<td>8</td>
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</tr>
</tbody>
</table>

Between Group Difference at Baseline \( p = 0.118 \)

Pre- vs. Post- Difference \( p < 0.001 \)

Treatment vs. Control Difference \( p = 0.11 \)

![Graph showing self-reported behaviour change over time](image)
Teaching Efficacy

No difference was demonstrated between groups at baseline, no pre- vs. post- difference, and no treatment vs. control difference. Therefore, both groups were similar at baseline and no change in teaching efficacy could be demonstrated in either group.

Teaching Self-Efficacy

Both groups were the same at baseline (p=0.895). A significant pre- vs. post- difference was demonstrated (p=0.002). The treatment vs. control difference approached, but did not achieve, statistical significance (p=0.273).

Self-Reported Teaching Behaviour

No between group difference was demonstrated at baseline (p=0.92). Pre- vs. post-, and treatment vs. control differences were statistically significant (p=0.001 and p=0.025 respectively). With case #14 removed p values were < 0.001 and 0.11 respectively.
Correlation of Self-Efficacy with Self-Reported Behaviours

One of the questions that this study proposes to answer is, "Is a change in self-efficacy (i.e., attitude subconstruct) associated with a change in self-reported teaching behaviours?" Therefore, the change in both teaching efficacy (TE) and teaching self-efficacy (TSE) (i.e., change = post - pre) was correlated with the change in self-reported teaching behaviours (SRB) (i.e., change = post - pre). Data from all subjects (i.e., treatment and control) was used to calculate a Pearson's correlation coefficient.

<table>
<thead>
<tr>
<th>Pearson's r</th>
<th>Change in TE</th>
<th>Change in TSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in SRB</td>
<td>0.21</td>
<td>0.66</td>
</tr>
</tbody>
</table>

TE = Teaching Efficacy  
TSE = Teaching Self-Efficacy  
SRB = Self-Reported Teaching Behaviours

Therefore, a change in teaching efficacy beliefs was
moderately correlated with a change in self-reported teaching behaviours. However, a more impressive correlation was found between a change in teaching self-efficacy beliefs and a change in self-reported teaching behaviours.

Sections II: Beliefs About Teaching

The results of this part of the questionnaire are reported in the following pages. Data from both the control (n=8) and treatment (n=11) groups for each of the 15 questions are presented on a separate page (i.e., one question per page). The mean and standard deviation (SD) are reported pre- and post- for both groups. The means represent the average agreement to the question statement on a 5 point Likert scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree. The mean difference (Mean diff.) pre- and post- (i.e., mean post - mean pre) and the level of significance (i.e., p; two-tailed paired student t-test) for this difference is also reported. The mean difference represents the amount of change from pre- to post- on a 5 point scale. For instance, a 0.5 difference represents an increase of one half scale point in agreement to the statement question.

In order to demonstrate that both groups were similar at
baseline, a non-paired, two-tailed student t-test was performed on the means of both groups at the outset (i.e., control-pre vs. treatment-pre) - see "All Pre-." The mean difference (Mean diff) between groups is also reported. The two means (i.e., control-pre and treatment-pre) are also taken to represent the beliefs of general internal medicine residents at baseline.
#1. Teaching Is A Primary Responsibility Of Residents

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#2. Residents Play An Important Role In Teaching Students

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#3. Teaching Students Helps Me Be A Better Clinician

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#4. Lectures Are The Best Way To Teach Clinical Medicine

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#5. Providing Students With Information On My Experience And My Readings Is The Most Effective Way To Teach

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#6. There Is Enough Time In The Day To Effectively Teach Students

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#7. It Is Important That My Students Enjoy Themselves While Working With Me

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#8. It Is My Role To Keep Students Motivated And Interested

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#9. MSI’s (Clinical Clerks) Are Primarily Physicians And Should Be Treated As Such (i.e., Given The Same Responsibilities As Physicians)

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#10. I Feel Frustrated Teaching Students Because I May Not Know All The Facts

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#11. I Worry That MSI's Poor Performance Will Reflect On Me

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#12. Given the day to day demands of ward work, there is no time left over to effectively teach medical students

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#13. MSI's Are Primarily Students And Care Must Be Taken Not To Give Them Too Much Responsibility

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#14. I Have Difficulty Giving MSI's Too Many Patient Care Responsibilities Because I Am Ultimately Responsible For Their Mistakes

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#15. Residents Are Important Role Models For Medical Students

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<td>Mean diff.</td>
<td>-0.07</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td></td>
<td>0.70</td>
</tr>
</tbody>
</table>
No significant differences between groups were demonstrated at baseline (see “All Pre-” for each question). However, a baseline difference approaching statistical significance (at the 0.05 level) was demonstrated for 2 of the 15 questions: #6. There Is Enough Time In The Day To Effectively Teach Students (control pre- mean=2.00, treatment pre- mean=3.00, mean diff.=1.00, p=0.052), and #11. I Worry That MSI's Poor Performance Will Reflect On Me (control pre- mean=2.38, treatment pre- mean=3.00, mean diff.=0.63, p=0.065).

A significant pre- and post- difference was found for 5 of 15 questions for the treatment group: #2. Residents Play An Important Role In Teaching Students (treatment pre- mean=4.18, treatment post- mean=4.73, mean diff.=0.55, p=0.025),
#5. Providing Students With Information On My Experience And My Readings Is The Most Effective Way To Teach (treatment pre- mean=3.55, treatment post- mean=2.91, mean diff.=0.64, p=0.026),
#9. MSI's (Clinical Clerks) Are Primarily Physicians And Should Be Treated As Such (i.e., Given The Same Responsibilities As Physicians) (treatment pre- mean=3.09, treatment post- mean=3.91, mean diff.=0.82, p=0.020),
#13. MSI's Are Primarily Students And Care Must Be Taken
Not To Give Them Too Much Responsibility (treatment pre-mean=2.91, treatment post-mean=2.18, mean diff.=-0.73, p=0.012), and

#15. Residents Are Important Role Models For Medical Students (treatment pre-mean=4.18, treatment post-mean=4.55, mean diff.=0.36, p=0.038).

A difference approaching statistical significance (at the 0.05 level) was found for the treatment group for one additional question:

#10. I Feel Frustrated Teaching Students Because I May Not Know All The Facts (treatment pre-mean=3.64, treatment post-mean=2.91, mean diff.=-0.73, p=0.054).

All of these differences represent "improvements" in beliefs about teaching. These improvements are significant not only at the statistical level, but also on the level of magnitude: one third to almost one full point on a 5 point Likert scale (i.e., 0.36 - 0.82).

In contrast, a significant pre- and post- difference was found for only 1 of 15 questions for the control group:

#14. I Have Difficulty Giving MSI's Too Many Patient Care Responsibilities Because I Am Ultimately Responsible For Their Mistakes (control pre-mean=3.00, control post-mean=2.13,
Section IV. Interest in Teaching

The results of this part of the questionnaire are reported in the following pages. Data from both the control (n=8) and treatment (n=11) groups for each of the 5 questions are presented on a separate page (i.e., one question per page). The mean and standard deviation (SD) are reported pre- and post- for both groups (except question #3). The means represent the average agreement to the question statement on a 5 point Likert scale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree. The mean difference (Mean diff.) pre- and post- (i.e., mean post - mean pre) and the level of significance (i.e., p; two-tailed paired student t-test) for this difference is also reported. The mean difference represents the amount of change from pre- to post- on a 5 point scale. For instance, a 0.5 difference represents an increase of one half scale point in agreement to the statement question.

In order to demonstrate that both groups were similar at baseline, a non-paired, two-tailed student t-test was performed on the means of both groups at the outset (i.e., control-pre vs.
treatment-pre) - see “All Pre-.” The mean difference (Mean diff) between groups is also reported. The two means (i.e., control-pre and treatment-pre) are also taken to represent the beliefs of general internal medicine residents at baseline.
#1. I Routinely Ask Students For Feedback On My Teaching Effectiveness

<table>
<thead>
<tr>
<th></th>
<th>Control (n=8)</th>
<th>Treatment (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-</td>
<td>Post-</td>
</tr>
<tr>
<td>Mean</td>
<td>3.00</td>
<td>3.25</td>
</tr>
<tr>
<td>SD</td>
<td>0.93</td>
<td>1.04</td>
</tr>
<tr>
<td>Mean diff.</td>
<td>0.25</td>
<td></td>
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<tr>
<td>p =</td>
<td>0.52</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>All Pre-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>3.00</td>
</tr>
<tr>
<td>Pre-</td>
<td>2.73</td>
</tr>
<tr>
<td>Treatment</td>
<td>0.93</td>
</tr>
<tr>
<td>Pre-</td>
<td>0.79</td>
</tr>
<tr>
<td>Mean diff.</td>
<td>-0.27</td>
</tr>
<tr>
<td>p =</td>
<td>0.45</td>
</tr>
</tbody>
</table>
#2. Overall, I Put More Effort Into Teaching Than Most Of My Peers

<table>
<thead>
<tr>
<th></th>
<th>Control (n=8)</th>
<th>Treatment (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-</td>
<td>Post-</td>
</tr>
<tr>
<td>Mean</td>
<td>2.88</td>
<td>3.38</td>
</tr>
<tr>
<td>SD</td>
<td>0.64</td>
<td>0.74</td>
</tr>
<tr>
<td>Mean diff.</td>
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<td></td>
</tr>
<tr>
<td>p =</td>
<td>0.23</td>
<td></td>
</tr>
</tbody>
</table>

All Pre-

<table>
<thead>
<tr>
<th></th>
<th>Pre- Control</th>
<th>Pre-Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2.88</td>
<td>2.82</td>
</tr>
<tr>
<td>SD</td>
<td>0.64</td>
<td>0.75</td>
</tr>
<tr>
<td>Mean diff.</td>
<td></td>
<td>-0.06</td>
</tr>
<tr>
<td>p =</td>
<td></td>
<td>0.86</td>
</tr>
</tbody>
</table>
#3. I Have Had Previous “Teacher Training”

<table>
<thead>
<tr>
<th></th>
<th>Control (n=8)</th>
<th>Treatment (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-</td>
<td>Post-</td>
</tr>
<tr>
<td>Yes</td>
<td>0/8</td>
<td>0/8</td>
</tr>
<tr>
<td></td>
<td>(9%)</td>
<td></td>
</tr>
<tr>
<td>TIPS Course</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>8/8 (100%)</td>
<td>8/8 (100%)</td>
</tr>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

All Pre-

<table>
<thead>
<tr>
<th></th>
<th>Pre-Control</th>
<th>Pre-Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>0/8</td>
<td>0/11</td>
</tr>
<tr>
<td>No</td>
<td>8/8 (100%)</td>
<td>11/11 (100%)</td>
</tr>
</tbody>
</table>
#4. If Time Situations Were Ideal, I Would Prefer To Spend More Time Teaching

<table>
<thead>
<tr>
<th></th>
<th>Control (n=8)</th>
<th>Treatment (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-</td>
<td>Post-</td>
</tr>
<tr>
<td>Mean</td>
<td>4.25</td>
<td>4.25</td>
</tr>
<tr>
<td>SD</td>
<td>0.71</td>
<td>0.71</td>
</tr>
<tr>
<td>Mean diff.</td>
<td>0.00</td>
<td>0.09</td>
</tr>
<tr>
<td>p =</td>
<td>0.00</td>
<td>0.68</td>
</tr>
</tbody>
</table>

All Pre-

<table>
<thead>
<tr>
<th></th>
<th>Pre-Control</th>
<th>Pre-Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.25</td>
<td>3.91</td>
</tr>
<tr>
<td>SD</td>
<td>0.71</td>
<td>0.94</td>
</tr>
<tr>
<td>Mean diff.</td>
<td>-0.34</td>
<td></td>
</tr>
<tr>
<td>p =</td>
<td>0.36</td>
<td></td>
</tr>
</tbody>
</table>
#5. I Would Be Interested In Attending A Workshop / Seminars On Teaching

<table>
<thead>
<tr>
<th></th>
<th>Control (n=8)</th>
<th>Treatment (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-</td>
<td>Post-</td>
</tr>
<tr>
<td>Mean</td>
<td>4.25</td>
<td>4.38</td>
</tr>
<tr>
<td>SD</td>
<td>0.71</td>
<td>0.52</td>
</tr>
<tr>
<td>Mean diff.</td>
<td>0.13</td>
<td>-0.27</td>
</tr>
<tr>
<td>p =</td>
<td>0.60</td>
<td></td>
</tr>
</tbody>
</table>

All Pre-

<table>
<thead>
<tr>
<th></th>
<th>Pre-Control</th>
<th>Pre-Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.25</td>
<td>4.18</td>
</tr>
<tr>
<td>SD</td>
<td>0.71</td>
<td>0.98</td>
</tr>
<tr>
<td>Mean diff.</td>
<td>-0.07</td>
<td></td>
</tr>
<tr>
<td>p =</td>
<td>0.86</td>
<td></td>
</tr>
</tbody>
</table>
Question #3 revealed that none of the 19 residents had prior teacher education experience at baseline (control n=8 and treatment n=11). Of the four remaining questions, no significant differences between groups were demonstrated at baseline (see "All Pre-" for each question).

A significant pre- and post- difference was found for 2 of 4 questions for the treatment group:

#1. I Routinely Ask Students For Feedback On My Teaching Effectiveness (treatment pre- mean=2.73, treatment post-mean=3.45, mean diff.=0.73, p=0.012), and

#2. Overall, I Put More Effort Into Teaching Than Most Of My Peers (treatment pre- mean=2.82, treatment post-mean=3.45, mean diff.=0.64, p=0.002).

In contrast, no significant pre- and post- differences were found for the control group.

Program Evaluation

A copy of the program evaluation instrument, and detailed results and analysis of the program evaluation are available in Appendix B.
Attendance was good overall, and was more than 90% for the first four sessions. The last two sessions (i.e., #5 Cognitive Learning Principles and Problem Solving Strategies, and #6 Small Group Teaching) had attendance rates of 62% and 85% respectively.

For each session, residents’ were asked to respond to the following questions on a 5 point Likert agreement scale (1=strongly disagree, and 5=strongly agree): “This topic was helpful to me in my teaching role as a CTU resident.” Responses ranged from 4.25 to 4.67, except for session #6 Small Group Teaching were it was 3.73. Upon further discussion with the residents, this session was dropped for the last two groups.

Overall, residents were satisfied with the course, with its content, and with the method of instruction as is demonstrated by a sample of responses (overall group mean on a 5 point Likert agreement scale).

#1 Overall, it was a worthwhile course  4.77

#3 I would recommend this course to other residents who have a teaching assignment  4.62
The instructor was an effective teacher 4.62
The course content addressed my needs for my teaching role as a CTU resident 4.23

Open ended questions asked residents to consider the following:

A. How did this series of seminars change your approach to teaching / learning on the CTU and teaching / learning in general?

B. What was the most helpful aspect for this course?

C. What was the least helpful aspect for this course?

D. Suggestions for improvement.

Transcribed responses are available as part of Appendix B.
CHAPTER FIVE: DISCUSSION AND CONCLUSIONS

Introduction

"Perhaps the most important single cause of a person’s success or failure educationally has to do with the question of what he believes about himself.” Arthur Combs p. 307 (Pajares, 1992)

Residents provide the majority of instruction for other housestaff (Bing-You & Harvey, 1991; Brown, 1970; Lowry, 1976). Some have argued that no one is more available or more qualified for this task (Steward & Feltovich, 1988), and that the resident’s role is not redundant with that of faculty (Tremonti and Biddle, 1982). Most residents look forward to teaching responsibilities (Barrow, 1966; Bing-You & Sproul, 1992). Unfortunately, that residents spend more time with students and are “closer” to their level does not necessarily make them effective teachers. Residents are rated as less effective than faculty (Irby, 1978). Observation studies have found that residents exhibit “few of the teaching behaviours that can enhance learning in an inpatient care setting” (Wilkerson, Lesky, & Medio, 1986, p. 827), and that they frequently use an authoritarian lecture style in teaching (Lewis & Kappelman, 1984). Daily patient rounds are not often
intentionally used for teaching; when they are, it is usually in
the form of brief lectures (Medio, Wilkerson, Lesky, & Borkan,
1988). Residents need to become aware and take advantage of
“teachable moments” (Meleca & Pearsol, 1988).

Residents generally have a positive attitude towards teaching
(Apter, et al., 1988; Bing-You and Harvey, 1991). Despite their
interest, and the fact that they have major teaching
responsibilities, evidence exists that residents do not receive
enough support or preparation for this role and that barriers
hinder optimal teaching (Anderson, Anderson, & Scholten,
1990). Few programs provide residents with feedback on their
teaching, and 60% of residency program directors did not
believe it was important for residents to receive formal
training in teaching skills. Only 14% of residents in the above
study had attended workshops on teaching. This finding is in
keeping with the results of other studies (Brown, 1971; Bing-
You & Harvey, 1991; Callen & Roberts, 1980). Schiffman
(1986) asks: “How then do house officers learn how to teach?
The obvious answer is that the house officer has had twenty
years of observation of his or her own teachers upon which to
model his or her style” (p. 55). This remains inadequate.

This research study reports the development, implementation,
and evaluation of a resident Teacher Education Program
(TEP), and examines its impact on internal medicine residents, more specifically, on residents' (1) sense of teaching self-efficacy, (2) self reported teaching behaviours, (3) beliefs about teaching, and (4) interest in teaching.

The Resident TEP Curriculum

This dissertation describes, in detail, the content of a resident TEP successful in improving residents' self-efficacy and teaching behaviours. The content addressed residents' specific needs as teachers on the CTU, as assessed by the residents themselves. This dissertation should be helpful in defining future resident TEP curricula.

According to Pratt (1992) conceptions of teaching are "a dynamic and interdependent trilogy of Actions, Intentions, and Beliefs" (original emphasis) (p. 206). The reader has been provided with an extensive review of the relevant adult education literature in chapter two. A detailed rationale for the use of a constructivist paradigm in the development and implementation of the resident TEP was given. The importance of reflection, situated learning, and self-efficacy was reviewed. The hope was to provide the reader with the epistemic beliefs and assumptions, as well as the intentions
that informed the strategies developed and used in the resident TEP.

To begin with, the principles of andragogy were kept in mind (Knowles, 1980). These principles provided direction for some of the practical considerations in organizing the course. By having the TEP coincide with residents' CTU rotation (i.e., while they have major teaching responsibilities), the program dealt with residents' immediate interests and concerns; also, new knowledge was immediately applicable. Concepts and principles were stressed, rather than facts, and the program stressed the active participation of residents. Ample feedback was provided so that residents could evaluate their progress. Overall, residents were viewed as users rather than recipients of education.

More importantly, however, a constructivist epistemology was at the root of the whole program. The major focus is on having residents make the transition to "thinking like a teacher." The emphasis was on qualitative changes in understanding rather than the acquisition of knowledge, skills, and attitude (i.e., quantitative). Implicit in this qualitative change is an appreciation for the starting point of the learner. This required a shift in assumptions about what it means to "know," and to "learn," and an analogous shift in the meaning
of teaching. From a constructivist perspective "teaching (focuses) on what can be changed in the learner's understanding" (Ramsden, 1988b, p. 21). A "relational" view of teaching was held during the development and implementation of all aspects of the TEP: (1) learning is about change in conception, (2) learning always has content as well as process, (3) improving learning is about relations between learners and subject matter, not teaching methods and student characteristics, (4) improving learning is about understanding the student's perspective, and (5) educational research and teaching are more closely related than people sometimes believe (Ramsden, 1988b).

Understanding students' conceptions (and misconceptions) is the best starting point of teaching from a constructivist perspective. Therefore, teaching involves two basic steps: probing understanding in order to map students' thinking, and helping students develop new (or more appropriate) conceptions. Marton and Ramsden (1988) suggest several teaching strategies for conceptual change learning: (1) make the learners' conceptions explicit to them, (2) focus on a few critical issues and show how they relate, (3) highlight the inconsistencies within and the consequences of learners' conceptions, (4) create situations where learners centre attention on relevant aspects, (5) present the learners with
new ways of seeing, (6) integrate the “knowing what” and “knowing how” of a subject, (7) test understanding of phenomena; use the results for diagnostic assessment and curriculum design, and (8) use reflective teaching strategies (italics mine).

The absence of specific goals and objectives for the TEP is not an oversight and is in keeping with a constructivist epistemology. The broad goals of the program allowed for qualitatively and quantitatively different learning outcomes for different residents; the main focus being on facilitating residents achievement of personal goals and objectives.

Reflection also played an important role in the resident TEP. Duley (1981, cited in Boud, et al., 1985), emphasizes that, “the skill of experiential learning in which people tend to be the most deficient is reflection” (p. 611). Berliner (1987) suggests that the old aphorism that experience is the best teacher should be more accurately restated as, “experience that is reflected upon is a very good teacher” (p. 60). He reminds us that although experience and expertise emanate from the same root, they do not mean the same thing. Experience is a necessary, but not sufficient, condition leading to expertise. Reflection on experience may help translate practical experiences into learning and expertise. This is in keeping
with the idea of “reflection-on-action,” as proposed by Schon (1987). Further, Schon suggests that we should learn to reflect in the midst of action: “reflection-in-action.” He argues that both these types of reflection, as part of a “reflective practicum,” enable professionals to learn to deal with the indeterminate zones of practice - ambiguity, uncertainty, and value conflict. Having residents learn to reflect-on-action, and reflect-in-action was a major goal of the program, and stated as such. The idea was not only to use reflection as a learning tool during the TEP, but to have residents learn and adopt reflection as a metacognitive skill for use in future learning and in all aspects of their professional lives. Therefore, several opportunities were created, and the use of reflection was supported during the TEP.

The idea of situated learning played an important role in the TEP. From this perspective, learning is viewed, not as the acquisition of knowledge transferred by instruction nor as the imitation of others, but as a form of social coparticipation (Lave and Wenger, 1991). The concern is with the types of social opportunities that provide the optimal context for learning, rather than with cognitive processes and conceptual structures. “The individual learner is not gaining a discrete body of abstract knowledge which (s)he will then transport
and reapply in later contexts. Instead, (s)he acquires the skill to perform by actually engaging in the process, under the attenuated conditions of *legitimate peripheral participation*" (original emphasis) (p. 14). A resident TEP is a perfect opportunity for engaging residents in authentic activity and facilitating movement from the periphery of practice towards its centre, as residents develop increasing teaching skills and take on more teaching responsibilities. Lave and Wenger (1991) maintain that learning and the development of a sense of identity are inseparable. "Moving towards full participation in practice involves not just greater commitment of time, intensified effort, more and broader responsibilities within the community, and more difficult and risky tasks, but, more significantly, an increasing sense of identity as a master practitioner" (italics mine) (p. 111). This last idea is in keeping with the development of self-efficacy through the cultivation of personal mastery experiences (Bandura, 1977). Most TEPs reviewed in chapter two did not take specific advantage of residents' current teaching assignments as a learning resource. One program (Snell, 1989) did mention that residents had "an opportunity to practice the (newly learned teaching) skills on the wards during the weeks between sessions" (italics mine) (p. 125). Another program, consisting of two three-hour workshops, separated both workshops by 5 months so that "the experimental group had
an opportunity to apply these (teaching) skills in their daily activities” (italics mine) (p. 361). Unfortunately, without structure and follow-up, students (including residents) do not always take advantage of opportunities. None of the programs specifically structured and included such learning activities.

Although “reflection-on-action” and “reflection-in-action” were the main goals articulated to the residents, enhanced teaching self-efficacy was the major goal from the author’s perspective. The literature on the social / situated perspective of adult education demonstrates that knowing “what” does not necessarily mean knowing “how” (e.g., Lave and Wenger, 1991). Bandura’s work on self-efficacy takes this idea one step further. Knowing “how” does not necessarily mean believing one “can” (and consequently “will”). Therefore, situating learning in authentic activity is not only important to provide the learner with knowledge and skills but to provide successful experiences (i.e., mastery experiences) and thereby, enhancing students’ self-efficacy. Self-efficacy “plays a central role in the exercise of personal agency by its strong impact on though, affect, motivation, and action” (Bandura, 1991, p. 248). Bandura (1977) postulates that individuals develop outcome expectations based on life experiences, and efficacy beliefs concerning their ability to cope. Similarly, a two dimensional model of teaching efficacy has been proposed (Ashton, 1984):
teaching efficacy (cf., outcome expectation) and teaching self-efficacy (cf., efficacy beliefs). "Teachers with a low sense of efficacy doubt their ability to influence student learning; consequently, they tend to avoid activities they believe to be beyond their capabilities. They reduce their efforts or give up entirely when confronted with difficulties" (Ashton and Webb, 1986, p. 3).

The resident TEP, therefore, went beyond simply helping resident reconceptualize their role as teachers. The provision of numerous exercises (e.g., role play), as well as the timing of the TEP while residents had teaching responsibilities, allowed residents to cultivate the important personal mastery experiences necessary to enhance perceived teaching self-efficacy.

In keeping with Mezirow's (1991) concern with "the disturbing fault line" that separates adult learning theories from practice, an attempt was made to synthesize the educational concepts discussed above (i.e., constructivism, reflection, situated learning, and self-efficacy). The best example of the marriage of these concepts is reflected in the use of the case method, and "Tasks for the Week."

Perhaps what most distinguishes the resident TEP described in
this dissertation, from those reported in the literature, is the strong theoretical grounding of the process (cf., content) and the emphasis on non-behavioural objectives.

Statement of Results

Instrument

Given the context specificity of beliefs (and belief subconstructs) an instrument was developed to specifically address the needs of this study, and consisted of the following four sections (see appendix A):

I. Teaching Scale (self-efficacy),
II. Residents as Teachers - Opinion (beliefs about teaching),
III. Teaching Skills (self-reported behaviours), and
IV. Interest in Teaching.

Sections I and III are scales, whereas, sections II and IV are descriptive. Both of the scales performed well during piloting and faculty validating studies, and during subsequent use in the research project. The results are in keeping with other teaching efficacy scales reported in the literature (e.g., Gibson and Dembo, 1984, and Enochs and Riggs, 1990).
Chapter two reviewed the literature for construct validity of self-efficacy and teaching self-efficacy. It was beyond the scope of this dissertation to repeat this work. However, a small study was carried out to provide evidence of the instrument's validity. Faculty members' scores on the self-efficacy subscales were correlated with scores on the self-reported teaching behaviour scale and data from student ratings of faculty teaching. As predicted by the two dimensional self-efficacy model, both self-reported teaching behaviours and student ratings showed a far greater correlation to teaching self-efficacy than to teaching efficacy (i.e., 0.57 and 0.30, vs. 0.14 and -0.17 respectively). Teachers with higher scores on the self-efficacy subscale had higher scores of teaching behaviours (as measured by self-report) and were rated as more effective teachers by their students. The agreement of student ratings is important given that it provides an outside perspective on teacher effectiveness. The higher correlation seen with self-reported behaviour is consistent with the fact that both the teaching self-efficacy subscale and the self-reported behaviour scale were of the same type (i.e., pencil and paper self-reports).
Study Results and Discussion

Research Questions

1. What attitude do general internal medicine residents have towards teaching (i.e., self-efficacy, beliefs about teaching, and interest in teaching)?

Clark (1988) noted that teachers' beliefs "tend to be eclectic aggregations of cause-effect propositions from many sources, rules of thumb, generalizations drawn from personal experience, beliefs, values, biases, and prejudices" (p. 5). Beliefs cannot be investigated directly but must be inferred. Inferential evidence comes from three main sources: (1) belief statements, (2) intentionality to behave in a predisposed manner, and (3) behaviour related to the belief in question (Rokeach, 1968 cited in Pajares, 1992). The operational definition of teaching attitude for this dissertation included teaching efficacy beliefs, opinions about teaching, and interest in teaching. These are reflected in sections I, II, and IV of the study instrument (i.e., Teaching Scale (self-efficacy), Residents as Teachers - Opinion (beliefs about teaching), and Interest in Teaching respectively).

The word "attitude" has been used as a catch all in studies of
resident teaching. Attitude items have included a mixture of perception, self reported behaviour, interest, and enjoyment.

Residents, generally, have a positive “attitude” towards their role as teachers. The vast majority of residents enjoy teaching (89% of 68 respondents) (Apter, et al., 1988). In this study, enjoyment of teaching was positively associated with increased preparation time and perception of positive results of teaching. Bing-You and Harvey (1991) were the first to address whether an association between a positive attitude towards teaching and student evaluations of teaching exists. Unfortunately, no correlation was found between student ratings of residents as teachers and residents' self-assessment of teaching effectiveness. Of note, residents having participated in a TEP were more confident as teachers, were rated more highly in actively involving students and in providing direction and feedback, and were also more confident as teachers.

Results (i.e., answer to Question 1)

Baseline data (i.e., pre-) for both the control (n=8) and treatment (n=11) groups were used to define the teaching attitude of the general internal medicine residents at our institution.
I. Teaching scale (self-efficacy).

General internal medicine residents had a positive outcome expectancy for teaching (i.e., they believed teaching makes a difference) as demonstrated by the high scores on the teaching efficacy subscale (4.0 and 3.8). However, their efficacy beliefs concerning their own abilities as teachers was not rated as highly, as demonstrated by the lower scores on the teaching self-efficacy subscale (3.5 and 3.4).

Bandura (1977) postulates that individuals develop outcome expectations based on life experiences, and efficacy beliefs concerning their ability to cope. That is, outcome and efficacy are separate components of efficacy expectations. First, individuals must believe that the specified action will lead to the desired outcome (i.e., outcome expectation). Second, they must believe themselves capable of the specified action (i.e., self-efficacy belief). The expectations of personal mastery are important for initiating a behaviour, and for perseverance in the face of difficulties. Lack of expectations of personal efficacy play an important role in avoidance behaviour.

The discrepancy between scores on the teaching efficacy and teaching self-efficacy subscales, as well as the relatively low scores on the teaching self-efficacy subscale, suggest that self-
efficacy could play an important role as a goal for resident TEPs. The author agrees with Ashton and Webb (1986) that “the promotion of a high sense of efficacy in teachers and students must become an educational aim as important as academic achievement” (p. 176).

II. Residents as teachers - opinion (beliefs about teaching).

Overall, residents had a “positive” attitude towards teaching as demonstrated by the results in chapter 4. They saw themselves as playing an important role in teaching students (4.25 & 4.18), and as role models (4.25 & 4.18). They also appreciated the function that teaching has for their own learning (4.25 & 4.27). It is surprising, therefore, to discover their more neutral view of teaching as a responsibility (3.38 & 3.45).

There was general agreement among residents that lectures were not an effective means of teaching clinical medicine (2.13 & 2.0). Despite this, elements of a transmission model for teaching and learning persists as evidenced by responses to question #5: Providing Students With Information On My Experience And My Readings Is The Most Effective Way To
Teach (3.50 & 3.55). This is also apparent with the frustration residents feel regarding the adequacy of their own knowledge base as teachers (3.63 & 3.64).

It is likely that residents create an atmosphere conducive to learning given their concern for student enjoyment in the learning process (4.50 & 4.64) and the role they see for themselves as motivators (4.25 & 4.09).

Residents seem to be struggling with their concept of the appropriate role for MSIs. There is no strong agreement as to whether they should be treated as students (2.63 & 2.91) or as physicians (3.75 & 3.09). This struggle for a clear concept of an MSI’s role is further evidenced by the ambivalence residents feel in delegating responsibilities to MSIs and the responsibility they feel for MSIs’ mistakes (3.00 & 2.82). Ambivalence also exists in the worry that MSIs’ poor performance may reflect on them (2.38 & 3.00).

Time pressures are prominent in residents’ minds and they do not agree that there is enough time in the day for effective teaching given competing demands (2.00 & 3.00; 3.63 & 3.09).
IV. Interest in teaching.

None of the 19 residents in the study had prior teacher education experience. However, resident interest in teaching is apparent by their interest in participating in a workshop/seminar (4.25 & 4.18). They would also like to do more teaching if they had more time (4.25 & 3.91).

Despite this ostensible interest in teaching, residents did not feel that they put more effort into their teaching than their peers (2.88 & 2.82), nor did they routinely ask students for feedback on their teaching (3.00 & 2.73).

Overall, it seems that residents are interested in teaching. Competing demands and other factors may frustrate residents’ good intentions. Further inquiry into the institutional barriers that prevent residents from acting on their interest in teaching may provide avenues outside the usual realm of TEPs to enhance residents' roles as teachers.

2. What is the effect of a CTU rotation and associated teaching responsibilities on residents’ sense of teaching self-efficacy, self-reported teaching behaviours, beliefs about teaching, and interest in teaching?
Of interest, none of the studies reported in chapter two were specifically designed to measure the impact of a teaching responsibility itself on outcome measures. This is one of the research questions addressed by this dissertation. This question is important for at least two reasons. First, one needs to understand the role of a teaching experience on residents’ development as teachers (i.e., attitude and behaviours). Does the provision of an opportunity to develop teaching skills necessarily lead to this outcome. And if it did, what would the role of resident TEPs be (if any). Second, given that we do not know the effects of a teaching experience on residents’ attitude and behaviours, it would be difficult to sort out the result of the treatment (i.e., participation in the TEP) from simply having a teaching assignment given that both occurred concurrently. Therefore, the control group in this study has two functions. Participants in the control group have not participated in the resident TEP and thus, serve as controls for those who did (i.e., treatment group). In addition, pre- and post- measurement of study parameters for the control group give insight into the effects of a teaching assignment on resident teaching attitude and behaviours.
Results (i.e., answer to Question 2)

I. Teaching scale (self-efficacy).

The CTU rotation and the associated teaching assignment had no effect on residents' outcome expectancy beliefs about teaching which were already positive (4.0). That is to say, residents already believe that teaching makes a difference, and that the CTU / teaching experience had no effect on this belief.

The CTU / teaching experience had a modest, but statistically significant, effect on residents' teaching self-efficacy beliefs. It is difficult to quantify the increase in teaching self-efficacy. Pre- and post- raw scores tell us little given that they are dependent on the number of questions. The difference of the mean on the 5 point Likert scale is likely more meaningful, if still an imperfect measure. First, this method is not dependent on the number of questions. Second, the "anchors" (i.e., 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree) give meaning to movement on the scale.

The mean self-efficacy score increased from 3.5 to 3.7 for an increase of 0.2 on a 5 point scale (p=0.029).

Sources or efficacy expectations come from four sources: (1)
performance accomplishments, (2) vicarious experience, (3) verbal persuasion, and (4) emotional arousal (Bandura, 1986). Performance accomplishments “provide the most influential source of efficacy information because it is based on authentic mastery experiences” (italics mine) (Bandura, Adams, and Beyer, 1977, cited in Bandura, 1986, p. 399). Teaching responsibilities during the CTU rotation provided residents with authentic experiences. Such successful experiences (i.e., mastery) may be responsible for the increased self-efficacy reported by residents at the end of the CTU rotation.

II. Residents as teachers - opinion (beliefs about teaching).

As mentioned in the discussion of the first research question, resident's beliefs about teaching were generally positive. It is not surprising that a simple CTU / teaching assignment had little effect on residents' beliefs. A significant pre- and post-difference was found for only 1 of 15 questions. Therefore, residents beliefs, as assessed by section II of the study instrument, were essentially unchanged by the teaching assignment associated with the CTU rotation.
III. Teaching skills (self-reported behaviours).

The CTU rotation and the associated teaching assignment had no effect on residents' teaching behaviours (as assessed by self-report). Therefore, a teaching assignment, in and of itself, is not sufficient to bring about change in residents' teaching behaviours. Perhaps this statement could be more correctly worded by stating that there was no perception of change in residents' teaching behaviours as assessed by the residents themselves.

IV. Interest in teaching.

No significant pre- and post- differences were found for the 5 items in this section of the instrument. Therefore, the CTU / teaching experience had no effect on residents' interest in teaching.

3. What is the impact of a TEP on residents' sense of teaching self-efficacy, self-reported teaching behaviours, beliefs about teaching, and interest in teaching?

All but one of the studies designed to investigate the impact of
resident TEPs demonstrated a positive effect (i.e., Brown, 1971). Knowledge was not an important outcomes measure in the studies reviewed (Brown (1971), and Edwards, et al., (1986). Improving teaching behaviours has been the main focus of most studies assessing outcomes. Improvements in self-concept and self-reported behaviours were demonstrated in four studies (Bing-You & Greenberg, 1990; Edwards, et al., 1986; Edwards, et al., 1988; Snell, 1989). Although the construct of self-efficacy has not specifically been used as an outcomes measure, self-reported “self-confidence” has (Bing-You & Greenberg, 1990; Snell, 1989). Interestingly, those studies assessing changes in self-confidence did not seek to demonstrate an association with changes in teaching behaviours. Further, the impact of a teaching assignment itself (i.e., experience) on self-confidence has not been explicitly addressed. All three of these issues were specifically addressed in the study described in this dissertation.

The most interesting and best designed of the studies looking at self-confidence has been reported three times (Greenberg, et al., 1984; Greenberg, et al., 1988; Jewett, et al., 1982). The investigators used a pre-test / post-test control design to study the impact of the workshops (controls=27; treatment=26). Residents participating in the TEP showed improved confidence as compared to controls. Unfortunately, no
attempt was made to demonstrate an association of change in attitude with a change in behaviour (as does this dissertation). The authors report that “a number of significant correlations were found between the confidence of residents in both groups (experimental and control) as teachers and their perceptions of teaching as a responsibility” (p. 362). Of interest, many of the items in Greenberg, Goldberg, and Jewett’s (1984) instrument assessing residents’ perception of teaching responsibility could arguably be said to assess the various dimensions of teaching self-efficacy as described by Ashton (1984). It is not surprising, therefore, to find so many correlations between “confidence as a teacher” and perceptions of teaching as a responsibility. Most of the items in the perceptions of teaching as a responsibility simply tap the various dimensions of teaching self-efficacy. Further support for this argument comes from the fact that many of the items from this instrument (Greenberg, et al., 1984) were incorporated into this dissertation’s self-efficacy subscales, where good internal consistency reliability was found (see chapter 4).

Bing-You and Harvey (1991) studied the relationship between residents' attitude (as measured by a questionnaire) and student ratings of the residents' teaching skills. The authors comment that they have included two questions “to measure a
teacher's sense of self-efficacy-defined by Ashton (1984)” (p. 96). Interestingly, several other items from their questionnaire could be interpreted as measuring self-efficacy. No attempt was made to group these items into a “self-efficacy scale.”

Lawson and Harvill (1980) comment that most residents have no prior training in teaching skills, and that many are unconvinced of the benefits of taking part in a resident TEP. They argue that, “changing such negative attitude should be a primary goal of a teaching skills program” (p. 1004). Using an end of program questionnaire, the authors demonstrated a positive effect on residents' “attitude toward participating in a teaching skills program” (p. 1002).

Results (i.e., answer to Question 3)

This was the major research question of this dissertation. As mentioned previously, there was no difference between the control and treatment groups at baseline. The answer to question 2. above provides the results of the control group (i.e., pre- / post- differences at the beginning and end of a CTU rotation with a teaching assignment but WITHOUT the study intervention - participation in the resident TEP).
I. Teaching scale (self-efficacy).

The resident TEP had no effect on residents' outcome expectancy beliefs about teaching which were already positive (3.8). That is to say, residents already believe that teaching makes a difference, and that the resident TEP had no effect on this belief.

Residents participating in the TEP had a statistically significant improvement in teaching self-efficacy scores (from 3.4 to 3.8, for a gain of 0.4 on a 5 point scale; p=0.012). This represents twice the improvement experienced by the control group (0.4 vs. 0.2).

Multivariate analysis found no between group difference at baseline. The pre- vs. post- difference was significant (p=0.002). However, the treatment vs. control difference did not achieve statistical significance (p=0.273), although there was a trend in this direction. It is interesting to note that there was no difference between the control and treatment groups at baseline as assessed by both t-test and MANOVA. Further, the pre-/post- difference was significant for both the control and treatment group as assessed by t-test. However, the MANOVA did not reveal a control vs. treatment difference. This may be due to the small number of individuals in both
groups (i.e, control=8; treatment=11). A larger sample size would be needed to show a difference.

II. Residents as teachers - opinion (beliefs about teaching).

As mentioned in the discussion of the first research question, residents' beliefs about teaching were generally positive. Further, the CTU / teaching experience itself had little effect on the control group as evidenced by the significant pre- and post- difference for only 1 of 15 questions. In contrast, a significant pre- and post- difference was found for 5 of 15 questions for the treatment group. These results are remarkable, not only because of the number of items showing improvement (i.e., one third of total items) or the relative improvement vs. the control group (i.e., five-fold difference in number of items), but because of the significant positive skew at baseline for some of the items.

It would seem that residents participating in the TEP see themselves as playing an even more important role as teachers. The initial ambivalence towards the MSIs' role seems to have been resolved. MSIs are now viewed more as junior physicians rather than students. There is evidence that
residents are moving away from a transmission model for teaching and learning, and that they have a greater appreciation for their responsibilities as role models.

III. Teaching skills (self-reported behaviours).

Residents participating in the TEP had a large and statistically significant improvement in self-reported teaching behaviours scores (from 3.3 to 4.0, for a mean increase of 0.7 on a 5 point scale; \( p=0.002 \)). In contrast, no significant pre-/post- difference was found for the control group.

Using a “retro” vs. post comparison (see Chapter four for rationale), the magnitude of improvement was even greater (i.e., 0.9; \( p=0.001 \)).

Multivariate analysis found no between group difference at baseline. Both pre- vs. post-, and control vs. treatment differences achieved statistical significance (i.e., \( p = 0.001 \) and 0.025 respectively).
IV. Interest in teaching.

A significant pre- and post- difference was found for 2 of 4 questions for the treatment group. In contrast, no significant pre- and post- differences were found for the control group. Therefore, residents participating in the TEP showed evidence of increased interest in teaching despite the already positive skew of baseline results. Their interest in teaching is manifest by an increased request for student feedback of their teaching and the belief that they put more effort into teaching than their peers.

4. Is a change in self-efficacy (i.e., attitude subconstruct) associated with a change in self-reported teaching behaviours?

The changes in teaching efficacy and teaching self-efficacy (i.e., change = post - pre-) were correlated with the change in self-reported teaching behaviours. Data from all subjects (i.e., treatment and control) was used to calculate a Pearson's correlation coefficient.

A correlation coefficient of 0.21 was found for the associated changes between teaching efficacy and self-reported teaching behaviours. A correlation coefficient of 0.66 was found for the
associated changes between teaching self-efficacy and self-reported teaching behaviours. Therefore, a change in teaching efficacy beliefs was moderately correlated with a change in self-reported teaching behaviours. However, a more impressive correlation was found between a change in teaching self-efficacy beliefs and a change in self-reported teaching behaviours. Interestingly, these numbers are similar to those found during the instrument validation study with faculty (i.e., 0.14 and 0.57 respectively).

The results are in keeping with the two dimensional model of teaching efficacy. Positive outcome expectations (i.e., teaching efficacy) are a necessary but not sufficient prerequisite; residents must believe that teaching makes a difference in student outcome. But more importantly, they must believe that they themselves are able to bring about this change (i.e., teaching self-efficacy).

Teaching self-efficacy is, therefore, an important marker for effective teaching behaviours. If Bandura (1977) is correct, and efficacy beliefs are prior to and causal for behaviours, teaching self-efficacy should be considered an important part of any TEP. According to Bandura (Bandura, 1986, cited in Pajares, 1992) "people regulate their level and distribution of effort in accordance with the effects they expect their actions
to have. As a result, their behaviour is better predicted from their beliefs than from the actual consequences of their actions” (p. 324).

Program Evaluation

Attendance was over 90% for the first four sessions and dropped to 62% and 85% for the last two sessions. Residents thought that the topics were helpful for their teaching role (> 4.0) except for session #6, Small Group Teaching, where it was 3.73. Upon further discussion with the residents, this section of the course was dropped for the last two groups. Overall, residents were satisfied with the course as a whole, with its content, and with the method of instruction; mean scores on all satisfaction items were above 4.0 on a 5 point Likert scale (or below 2 for negatively worded items). Responses to open ended questions were also encouraging. A copy of the program evaluation instrument, and detailed results and analysis of the program evaluation are available in Appendix B.
Limitations of the Study

Like many other educational research studies, the study reported is limited by a number of practical considerations that make “true” experimentation difficult. It would have been impossible to use a randomized controlled design, therefore, a quasi-experimental design was used; assignment to each group was based on the preexisting CTU rotation schedule. No significant differences were found between the control and treatment groups at baseline for any of the outcome measures. The study is further limited by the small sample size for each group (i.e., control=8, treatment=11). Despite this, many of the results achieved statistical significance. The larger size of the treatment group may account for the higher number of significant results in this group.

Although the possibility that the positive results for the control group may be due to the “Hawthorne effect” (i.e., a non-specific effect of the intervention due to attention paid to the participants) exists, this effect was, at least partly, controlled by the involvement of the control group. The control subjects responded to the same pre- and post-questionnaire that the treatment group did. Further, the “control” subjects were part of another study used to
determine the appropriate content for a resident TEP (i.e., needs assessment) - the results of which are reported elsewhere (Arseneau, 1993). The control subjects were followed by the investigator during work rounds as part of a participant observation study. Afterwards, they were interviewed regarding their beliefs about teaching on the CTUs.

The results of the reported study are very context specific and claims of result generalizability should be made with caution. The residents at our institution may not be representative of those found at other institutions in terms of interest in teaching, beliefs, or prior experience. Further, their beliefs may be part of the wider "culture" found at our hospital.

Recommendations for Further Research

The findings of this dissertation are consistent with those of other investigators in that beliefs about teaching were strongly associated with teaching behaviours (see Pajares, 1992 for review). What remains to be shown, however, is a strong link between beliefs about teaching and student learning and achievement. As it stands, teaching beliefs are, at best, an incomplete and inconsistent set of predictors for teaching
behaviours. And teaching behaviours remain "surrogate markers" for the real objects of interest: student learning and achievement.

The tendency to use easy to measure belief subconstructs such as self-efficacy in educational research necessarily gives an incomplete picture of teachers' "belief systems." It negates the important relationships and interactions among belief subconstructs. It is unlikely that quantitative methods by themselves can provide all (or even most) of the answers. Not all belief subconstructs lend themselves well to measurement and scaling, as is demonstrated by this dissertation. Furthermore, there are finite limits to quantitative findings about beliefs; it is impossible for teachers to define their belief system with any degree of accuracy within the confines of specific research questions and questionnaire items. Qualitative methods will be needed to complement quantitative research if new insights are to be gained.

The timing of the post measurement used for this study (i.e., immediately at the end of the CTU rotation) leaves the question of the long term impact of the resident TEP unanswered. Although the results of this study demonstrate the success of a resident TEP based on "attitudinal" objectives, no comment can be made regarding the relative merits of a
program based on behavioural objectives, or whether a combination of attitudinal and behavioural objectives would be optimal. The reader is reminded of another important question posed in chapter two: whether or not focusing on attitudinal objectives results in slower “decay” of new behaviours? Unfortunately, these questions will have to remain unanswered for now.
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APPENDIX A

STUDY INSTRUMENTS

Pilot Instrument ................................................................. 289
Study Instrument ............................................................... 295
Study Instrument - "Retro" .................................................. 301

Note: All instruments have been printed at 75% the original size to allow binding.
Resident Teaching Instrument - Pilot Testing

Thank you for helping us pilot this instrument to measure resident teaching attitudes.

Many of the questions may appear to be asking the same thing. This is because we have included similar items for piloting the instrument so that we can assess which items give us the most information. Try and answer the questions without looking back at previous responses.

Thanks for your help

Demographic data:

1. Level of training  R1 (intern)
                        R2
                        R3
                        R4
                        Faculty
                        Other (specify)

2. Specialty ___________________________
## Resident Teaching Instrument - Pilot Testing

**I A. Teaching Scale**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>If teachers have adequate skills they can get through to even the most difficult students</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Teachers contribute significantly to student learning</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>The amount that a student can learn is primarily related to their degree of intelligence</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>A student’s poor previous academic performance can be overcome by good teaching</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>Even a teacher with excellent teaching skills cannot reach all students</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>The work teachers do with students is important and meaningful</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>When a student gets a better grade than usual, it is because the teacher found a better way of teaching that student</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>When a student does poorly it can usually be explained in terms of their academic ability, motivation, or attitude</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>When a “borderline” student makes significant achievement, it is because the teacher had a chance to give them extra attention</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>If a student masters a new medical concept quickly, it is because the teacher knew the steps in teaching that concept</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>When all factors are considered, teachers are not an important influence on student achievement</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>The amount of time teachers spend with students has little influence on student achievement when compared to their previous medical education</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13.</td>
<td>Students learn because of the experience they get on the wards rather than the specific teaching skills of</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
## I B. Personal Teaching Scale

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel confident as a teacher</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I look forward to rotations with teaching responsibilities</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. When a student does better than usual, it is because I exerted a little extra effort</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. When compared with their previous medical education, the amount of time I spend teaching students has little influence on their achievement</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. When I really try I can get through to the most difficult student</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I do not feel responsible if a student fails</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I have the skills to be an effective teacher</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I significantly contribute to student learning</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I am sometimes anxious anticipating questions students ask, for fear of a lack of knowledge on my part</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Students learn because of the experience they get on the wards rather than my specific teaching skills</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. I expect my students to do better than average, and they do</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. If a student masters a new medical concept quickly, it is because I knew the necessary steps in teaching that concept</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Teaching students is good for my self esteem</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. My students do no better than their peers</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. It is my responsibility to see that students learn while they are working with me</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. If a student isn't doing well, I examine my methods to see how I can improve things</td>
<td>1 2 3 4 5</td>
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<td>17. When a student gets a better grade than usual, it is</td>
<td>1 2 3 4 5</td>
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</tbody>
</table>
18. If a student forgot something that I taught them before, I would attempt a different strategy to improve retention.

19. If a student is having difficulty with a patient problem, I can assess if the patient problem is at the correct level for the student.

20. Medical students know what I expect of them.

21. My teaching is well organized.

22. I often think of new ways of presenting material.

23. When teaching on the wards, I don't use any specific strategies.

24. I enjoy working with students and teaching.

25. Given the choice I would prefer not working with students.

### II. Residents as Teachers - Opinion

1. Teaching is a primary responsibility of residents.

2. Residents play an important role in teaching students.

3. Teaching students helps me be a better clinician.

4. Lectures are the best way to teach clinical medicine.

5. Providing students with information on my experience and my readings is the most effective way to teach.

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2. I set specific learning goals for my students  

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3. I know the difference between feedback and evaluation  

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4. I routinely use feedback in student teaching  

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5. I routinely use evaluate students as part of my teaching  

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6. I have an organized approach to teaching problem solving strategies  

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8. I foster self directed learning about patients in my students  

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9. I understand the principles of small group dynamics during teaching  

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10. I apply the principles of small group dynamics when teaching small groups of students  

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IV. Interest in Teaching

1. I routinely ask students for feedback on my teaching effectiveness

2. Overall, I put more effort into teaching than most of my peers

3. I have had previous “teacher training”

4. If time situations were ideal, I would prefer to spend more time teaching

5. I would be interested in attending a workshop / seminars on teaching

THANKS FOR YOUR HELP !!

Ric Arseneau, MD, FRCPC
Director of Undergraduate Teaching (Medicine), St. Paul’s Hospital, U.B.C.
Resident Teaching Questionnaire

Chief Investigator: Ric Arseneau, MD, FRCPC.................................682-2344
Faculty Advisor: Kip Anastasiou, PhD........................................822-5316

The purpose of this questionnaire is to collect data on Residents’ beliefs regarding teaching and their teaching behaviors. The data is part of a “needs assessment” that will help us determine the most useful content for the upcoming workshops on “Resident teacher training.”

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Thank your for agreeing to participate!

Today’s Date:________________

Ward (circle one) A B C D

Level of training
R2
R3
R4
Other (specify)
# Resident Teaching Questionnaire

## I. Teaching Scale

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<tbody>
<tr>
<td>1. I significantly contribute to student learning</td>
<td>1</td>
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<td>5</td>
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<tr>
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297
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<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I know the difference between feedback and evaluation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I routinely use feedback in student teaching</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I routinely use evaluate students as part of my teaching</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I have an organized approach to teaching problem solving strategies</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I am aware of which behaviors can inhibit student learning and take specific steps to avoid them</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I foster self-directed learning about patients in my students</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I understand the principles of small group dynamics during teaching</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I apply the principles of small group dynamics when teaching small groups of students</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I am familiar with the principles of “one-on-one” teaching and use these principles when working with individual students</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
11. I know how to use questioning to bring about effective student learning

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>2</td>
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<td>4</td>
<td>5</td>
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</tbody>
</table>

12. I routinely confirm and review medical students physical findings at the bedside

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
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</tr>
</thead>
<tbody>
<tr>
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<tr>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</tbody>
</table>

13. I often demonstrate skills in the proper techniques of physical examination

<table>
<thead>
<tr>
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<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
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<tbody>
<tr>
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<table>
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<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

14. I provide an atmosphere that is conducive to learning

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

15. I often refer students to the medical literature

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

16. At the bedside, I provide a model of appropriate interactions with patients for the student

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</table>

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<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

IV. Interest in Teaching

1. I routinely ask students for feedback on my teaching effectiveness

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2. Overall, I put more effort into teaching than most of my peers

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3. I have had previous "teacher training"

   - TIPS course
   - Yes
   - No
   - other (specify)

4. If time situations were ideal, I would prefer to spend more time teaching

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

5. I would be interested in attending a workshop / seminars on teaching

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Note: Instrument have been printed at 75% the original size to allow binding.
### Resident Education Program: Evaluation

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall, it was a worthwhile course</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>My personal goals for taking this course were NOT met</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I would recommend this course to other residents who have a teaching assignment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I would take another course that was taught this way</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I would like to take a follow up course on this topic</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I would have preferred another method of teaching this course</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The course content addressed my needs for my teaching role as a CTU resident</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The course was interesting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The instructor encouraged the development of new viewpoints and appreciations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The instructor demonstrated a thorough knowledge of the subject matter</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The instructor was an effective teacher</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

### Regarding Specific Sessions:

#### 1) Introduction: Teaching Styles & Learning Styles

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you attend this session</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This topic was helpful to me in my teaching role as a CTU resident</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>This topic should be replaced with another more relevant topic in future courses</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

#### 2) Work Rounds and One Minute Teaching Skills

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you attend this session</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This topic was helpful to me in my teaching role as a CTU resident</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>This topic should be replaced with another more relevant topic in future courses</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
3) Feedback and Evaluation

- Did you attend this session
  
<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- This topic was helpful to me in my teaching role as a CTU resident
  
  | 1 | 2 | 3 | 4 | 5 |

- This topic should be replaced with another more relevant topic in future courses
  
  | Yes | No |

4) Questioning and Non Facilitating Teaching Behaviors

- Did you attend this session
  
<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- This topic was helpful to me in my teaching role as a CTU resident
  
  | 1 | 2 | 3 | 4 | 5 |

- This topic should be replaced with another more relevant topic in future courses
  
  | Yes | No |

5) Cognitive Learning Principles and Problem Solving Strategies

- Did you attend this session
  
<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- This topic was helpful to me in my teaching role as a CTU resident
  
  | 1 | 2 | 3 | 4 | 5 |

- This topic should be replaced with another more relevant topic in future courses
  
  | Yes | No |

6) Small Group Teaching

- Did you attend this session
  
<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- This topic was helpful to me in my teaching role as a CTU resident
  
  | 1 | 2 | 3 | 4 | 5 |

- This topic should be replaced with another more relevant topic in future courses
  
  | Yes | No |
Resident Education Program: Evaluation

How did this series of seminars change your approach to teaching/learning on the CTU and teaching/learning in general?

What was the most helpful aspect of this course?

What was the least helpful aspect of this course?

Suggestions for improvement

(Use reverse side if more space is needed)  
Thanks!  Ric
#1 Overall, it was a worthwhile course.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
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</tr>
<tr>
<td></td>
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<td></td>
</tr>
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#2 My personal goals for taking this course were NOT met.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
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<tbody>
<tr>
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<td>2.00</td>
<td>1.12</td>
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<tr>
<td>Median</td>
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<td></td>
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</tr>
<tr>
<td></td>
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#3 I would recommend this course to other residents who have a teaching assignment

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.62</td>
<td>5.00</td>
<td>0.51</td>
</tr>
<tr>
<td>Median</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#4 I would take another course that was taught this way

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
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<td>5.00</td>
<td>0.66</td>
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<tr>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

#5 I would like to take a follow-up course on this topic

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
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<td>4.00</td>
<td>0.63</td>
</tr>
<tr>
<td>Median</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

#6 I would have preferred another method of teaching this course

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
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<td>2.00</td>
<td>1.03</td>
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<tr>
<td>Median</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

#7 The course content addressed my needs for my teaching role as a CTU resident

<table>
<thead>
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<th></th>
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<th>Median</th>
<th>Standard Deviation</th>
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</thead>
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<td>0.83</td>
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<tr>
<td>Median</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

#8 The course was interesting

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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</table>
Program Evaluation: Item Response Statistics

<table>
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<tr>
<th>#9</th>
<th>The instructor encouraged the development of new viewpoints and appreciations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean 4.23</td>
</tr>
<tr>
<td></td>
<td>Median 4.00</td>
</tr>
<tr>
<td></td>
<td>Standard Deviation 0.73</td>
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<table>
<thead>
<tr>
<th>#10</th>
<th>The instructor demonstrated a thorough knowledge of the subject matter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean 4.69</td>
</tr>
<tr>
<td></td>
<td>Median 5.00</td>
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<tr>
<td></td>
<td>Standard Deviation 0.48</td>
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</table>

<table>
<thead>
<tr>
<th>#11</th>
<th>The instructor was an effective teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean 4.62</td>
</tr>
<tr>
<td></td>
<td>Median 5.00</td>
</tr>
<tr>
<td></td>
<td>Standard Deviation 0.51</td>
</tr>
</tbody>
</table>
## Program Evaluation: Attendance and Session Relevance

### #1 Introduction: Teaching Styles and Learning Styles

#### #1A Did you attend this session?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 (92%)</td>
<td>1 (8%)</td>
</tr>
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#### #1B This topic was helpful to me in my teaching role as a CTU resident

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### #2 Work Rounds and One Minute Teaching Skills

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### Program Evaluation: Attendance and Session Relevance

#### #3 Feedback and Evaluation

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Mean: 4.67  
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Standard Deviation: 0.49

#### #3A Did you attend this session?  
Yes 0 (0%)  
No 12/12 (100%)

#### #3C This topic should be replaced with another more relevant topic in future courses

Yes: 0 (0%)  
No: 12/12 (100%)

#### #4 Questioning and Non Facilitating Teaching Behaviors

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#### #4C Did you attend this session?  
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# Program Evaluation: Attendance and Session Relevance

## #5 Cognitive Learning Principles and Problem Solving Strategies

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## #6 Small Group Teaching

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Program Evaluation: Open Ended Questions

A. How did this series of seminars change your approach to teaching / learning on the CTU and teaching / learning in general?

1. More conscious to what I am doing or saying!

2. I'm more cognitively aware that the teaching by teacher is not equal to learning by learn. Ultimate end result is that of learning.

3. Made me more aware of the need of interaction, to encourage participation.

4. It certainly made me more cognizant of teaching and learning as a process. Aware of good practices and bad. I hoped it changed or improved my approach.

5. I was more aware of good teaching skills and behaviour.

6. More aware of how I was asking questions. More aware of how much teaching I was doing. More aware of role model.

7. Expanded my teaching style. Increased ease with teaching
2. Gave me ideas about how to attempt better / more effective teaching strategies / style. 3. Better appreciation of how inappropriate lecture style teaching is for small groups.

11. I never thought about how I learned or how I teach. It at least made me "aware". It also made me realize that to teach I did not have to be an almighty God of knowledge. I change somewhat from expert to socratic and with the better MSIs → interactive.

12. It provided an explicit framework to deal with teaching of MSIs. Up to now I have been using an intuitive approach to teaching and haven't really thought about CTU teaching in a formal manner.

13. Made me aware of what I do and what I should and Should not do. Lots of new ideas to encourage students to learn. ↓ pressure to impart knowledge. Show students how to learn rather than teaching them.
Program: Evaluation: Open Ended Questions (cont'd)

B. What was the most helpful aspect for this course?

1. Well presented. I learned a lot about teaching methods.

2. Provide a “thinking” method of previously “semi-conscious” process.

3. I felt more comfortable directing rounds or teaching. I didn’t mind so much, not to know all the answers myself.

4. Again, making me aware of good practices and reinforcing them. I actually felt the learning theory section, though less applicable made some points I’m sure that I will remember.

5. Learning above effective teaching skills and how students learn best (methods of problem solving).

6. Technique of how to ask questions and “Reflection in Action”.

7. Timing and course content.

8. Lots of good examples during course → helps to remember
them. Lots of application between sessions makes them more meaningful.

9. Identifying and formally naming teaching / learning skills and behaviours because I did find that I was already doing a lot of teaching but was not aware of it. With increased awareness it was easier to make more of an effort to be effective. Found the role playing quite effective (when we tried giving each other feedback etc.).

10. Change to hear from other residents - what their experiences and frustrations are. Practical tips. Good demonstrations. Organized approach and discussion.

11. Awareness of teaching strategies and goals. Realization that teaching was not just giving facts.

12. Providing a formalized approach to CTU teaching.

13. Teaching techniques, i.e. how students learn when exposed to different teaching styles and therefore which style is most appropriate for each student. How teaching methods affect learning.
C. What was the least helpful aspect for this course?

1. May be a bit too quick. I would like more time to apply the new knowledge.

2. Lack of actual on the ward feedback - _____ how is it going.

3. None

4. Whole course helpful.

5. Difficult to say because I found it very helpful!

6. The ideas were very good in theory, but difficult to incorporate given the realities and demands of CTU. More aware of where I was going wrong, but without the opportunity to fix it in most cases.

7. We the learning got no feedback that is relevant.

8. Large group vs. small group teaching.
Program: Evaluation: Open Ended Questions (cont'd)

D. Suggestions for improvement.

1. Less material per session.

2. A bit longer -? More practical points or pretend situations.

3. Some mechanism for actual on ward evaluation would be helpful.

4. None - would suggest more practice in teaching and feedback on teaching skills.

5. I think all residents should have this course.

6. Can the course be offered to more of the residents?  It was great - thanks.

7. Would be interesting to have 1-2 sessions with MSIs / interns in attendance, to hear their ideas about teaching and learning. Disappointing not to receive feedback on our teaching, more efforts should be made to ensure this occurs.

8. Make the sessions briefer (i.e., 45 min.)
Program: Evaluation: Open Ended Questions (cont'd)

9. Find a better time for course.
APPENDIX C

SESSION CONTENT

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Session 1 - Introduction: Teaching and Learning

Agenda

Introduction

Goals and Objectives for the Program

Course Content

Teaching and Learning
What Makes a Good Teacher?
Residents as Teachers
Learning Environment / Climate
Clinical Teaching Techniques for Residents
Tasks for the Week

Introduction

Docere = to teach

Root of the word "doctor"
See one. Do one. Teach one.

See one. Screw one. Do one.

Teaching as an Art (cf., Behavioural Science)

Implications of changing name from teacher training to teacher education
Content versus process
There is no single effective teaching method
It is hoped that residents will develop their own teaching styles through these sessions

Goals and Objectives

Make residents aware of their beliefs
Challenge their beliefs
Teaching as a way of "being" rather than "doing"
Reflection-on-action — reflection-in-action

Behavioural objectives
Beyond behavioural objectives - creative medical teaching

Course Content

1. Orientation / Teaching & Learning / Resident as Teacher-Manager
2. Work Rounds / “One Minute Teaching Skills”
3. Feedback & Evaluation
4. Asking Questions / Non-facilitating Teaching Behaviours
5. Problem Solving / Cognitive Learning Principles
6. Small Group Teaching
TASK:
Have residents generate their priorities while on the CTU
Patient care
Self education (i.e. learning)
Junior housestaff education (i.e. teaching)
Now demonstrate how they can all be one and the same, i.e., Patient care is the best environment to learn
To teach is to learn twice
"Three legged stool"

Teaching and Learning

Teaching Versus Learning

What is Teaching and Learning?
To help you understand teaching and learning, consider the following statement:
   "If the learner didn’t learn, then the teacher didn’t teach"
   Do you agree or disagree?

Picture the following cartoon strip:
A little boy tells his friend, "I taught Rover how to whistle!" With an ear up to the dog's face, the friend responds, "I don't hear him whistling." The first boy replies, "I said I taught him to whistle. I didn't say he learned it."

---

**TASK:**

Define teaching
Define learning

---

Some people believe that if there is no learning, there was no teaching

According to this view to teach is to give

Other people believe that teaching is anything done by the teacher that intentionally promotes learning

According to this view to teach is to offer

**Teaching styles**

---

**TASK:**
Explore the meaning of the following teaching styles

1. Expert consultant
2. Socratic
3. Collaborative teaching

1. Expert consultant: Expert knowledge is conveyed to the student in response to a question
2. Socratic: Teacher draws information from the student by thoughtful questioning in an effort to explore the limit of the student’s knowledge and problem solving strategies.
   The teacher needs a clearer understanding of the desired outcome
3. Collaborative teaching: A subtle difference from the socratic style
   In this approach, neither the student nor the teacher knows the answers or solutions to the problem presented
   They engage in a question and answer process seeking to better define the problem and to develop an approach towards it
   Unlike the socratic style, the teacher does not have a predetermined goal nor a clear knowledge of the solution to the problem
   Collaborative teaching is a process of mutual exploration and discovery
Teacher Directed Versus Student Directed

The Learner
Most text on teaching focus on the teacher and how to be more effective. The characteristics of the learner are sometimes overlooked. Individuals differ greatly in their learning potential, their readiness to learn, and how they learn most effectively. cf., learning styles, teaching styles

Teaching Methods
Two possible actors, the teacher and the learner
Two modes of behaviour, active and passive
Two locations for teaching and learning, a classroom (any room where people can sit and talk) and application sites

TASK:
Create a two by two matrix with active teacher, passive teacher, crossed by active learner, passive learner

What is your preferred learning method?
Learning
I hear and I forget. I see and I remember. I do and I understand.

Importance of student involvement in the learning process

Student Directed Learning

Thomas C. King believes that the overriding purpose of education is to make the learner independent of any need for a teacher (1983)

He contends that anything you do to build dependency is bad, and anything you do as a teacher to build independence is good.

He concludes that the teacher as an information giver is performing an immoral act.

The best teachers make themselves obsolete

Adult Learning Theory

Adult Learners
-Want to use what they learn soon after they learn it
-Interested in learning concepts and principles; they like to solve problems and not just learn facts. If they participate actively in the learning process, it is easier for them to apply
the concepts and principles they are learning.
- Learning is best when adult learners can proceed at their own pace.
- Motivation increases when adult learners help to set learning objectives. Motivation is usually highest when the subject matter relates to the immediate interest and concerns of the adult learners.
- Adult learners like to know how well they are doing; feedback helps them to evaluate their own progress.
Adults who seek to enhance their proficiencies see themselves as users, instead of recipients of education.

CASE:
RF is an R2 in medicine. She is scheduled for a CTU rotation at SPH. She looks forward to her new role as team leader and teacher. In fact, she spends many hours preparing small “talks” for the juniors before starting the rotation.

Her intern and MSI are particularly strong academically. During the first week, she gives one of her mini lectures - nephrotic syndrome - with well prepared overheads. She senses that the juniors are not very interested. She concludes that the juniors are not motivated and decides not to give any
more talks.

As the rotation proceeds a power struggle develops between the RF and the juniors. She tries to maintain control of the team and to teach by imparting information and her opinions on patient management. The juniors see her as controlling and overbearing.

What went wrong?

What Makes a Good Teacher?

TASK:
Think of your best and your worst clinical teacher.
List the characteristics of each

Rating forms (i.e., student rating of resident teaching-see appendix ***)
No coincidence that rating forms are constructed as they are
TASK:
Compare list of characteristics generated above with rating form
Also, compare with the following list:

Helpful Clinical Teachers
1. Answers questions clearly
2. Enthusiastic
3. Explain the basis for their actions and decisions
4. Provides students with opportunities to practice both technical and problem solving skills
5. Summarizes major points
6. Gives feedback without belittling
7. Demonstrates a genuine interest in students
8. Strives to make difficult concepts easy to understand
9. Emphasizes conceptual comprehension rather than factual recall
10. Accessible to students
11. Provides competent patient care and role modelling
12. Approaches their teaching with dynamism and energy
13. Prepare well for rounds and other contact with students
14. Explains lucidly
Residents as Teachers

Why do residents make particularly good teachers?
Faculty attendings are often too competent to do a good job. They may be so advanced in their own work that they have become oblivious to the needs of the novice. They are unconsciously competent.

Residents as Role Models

QUESTIONS:
What is a role model?
Does it always imply something positive?
Do you have a choice of whether or not to be a role model?
In what situations can role modelling be a powerful teaching tool?
What does it mean to be an “intentional role model”?
The socialization process

Role Modelling

Role model does not always imply good
You don’t have choice of being or not being a role model

The intentional role model

Powerful teaching tool
Instruction of attitudes
We cannot tell someone else how to be
Setting tone, pace and expectation

Role Modelling

Physicians model for students and residents the way to interact with the nurses, nursing assistants, secretaries, physical therapists, social workers, and other personnel. If physicians are courteous, even when frustrated, if they are friendly even when tired, if they try to correct errors instead of just complaining, they fulfil their hospital staff responsibilities willingly, by example they are helping to socialize the learners to their future roles as physicians in this setting.

TASK:

"Reflection in action" task
This week watch for and report good and bad role modelling
by yourself and others (i.e. attendings of other senior residents) - what impact do you think it had?

Learning Environment

QUESTIONS:
What is meant by "learning environment"?
What is meant by "safe to make mistakes"?
What is the interplay between learning environment, motivation, positive and negative reinforcement, and self esteem?
What is pimping?
How can you provide a positive learning environment?

Learning Climate: Favourable Learning Environment
Enthusiastic teacher
Time set aside for teaching
Learners treated with respect, not intimidated
Interaction by learners encouraged "supportive atmosphere"
"Safe" to make mistakes
Positive attitude to differences of opinion
Teacher not seen as all knowing
Teacher is a good role model

MSI tended to rate residents much higher than the residents rated themselves
Residents didn’t recognize this as an important aspect of the teaching role

Motivation

-My understanding of human behaviour is that when people do a good job and are told so, they feel motivated to do an even better job
-Whether you believe in carrots or sticks, motivation should be your concern because the formula for student learning can be expressed as motivation x ability
-Emotions play a key role in learning.
-Essentially, we remember what we understand, we understand what we pay attention to, and we pay attention to what we want to
TASKS FOR THE WEEK

1. Reflect on the way you interact with the juniors
   What is your main teaching style?
2. Watch your attending in actions
   What is their main teaching style?
3. Watch for and report good and bad role modelling by
   yourself and others (i.e. attendings of other senior residents)
   What impact do you think it had?
4. Watch for and report on the learning environment you
   provide to your students
Session 2 - Work Rounds and One Minute Teaching Skills

Agenda

Review of Last Weeks Tasks
Models for Work Rounds
Tips for Running Efficient Work Rounds
Delegating Work
One Minute Teaching Skills During Work Rounds
Microskills Role Play: One Minute Teaching Skills
Tasks for the Week

Review of Last Weeks Tasks

1. Reflect on the way you interact with the juniors
   What is your main teaching style?
2. Watch your attending in action
   What is their main teaching style?
3. Watch for and report good and bad role modelling by yourself and others (i.e. attendings of other senior residents)
   What impact do you think it had?
4. Watch for and report on the learning environment you provide to your students
Models for Work Rounds

CASES:

1. Each day after morning report, the team does work rounds. They take the chart rack and see all the patients as a group. The resident usually questions and examines the patients. The juniors write the orders based on the resident’s findings. They also make a “to do” list for the day.

2. Each day after morning report, the juniors go off to see their own patients. The resident “trouble shoots” from the nursing station and is available to answer the juniors questions. The resident will go to the bedside at the request of the junior, if they are uncertain about something. At the end of the day, each junior signs out with the resident, usually one-one-one.

3. Each day after morning report, the team does work rounds. They take the chart rack and see all the patients as a group. The team usually takes 15-20 minutes for each of the first few patients. The resident often gives mini-lectures at the bedside. The end of rounds are usually frantic as the team tries to see the remaining half of the patients in 30 minutes. This often
leaves the juniors frustrated and confused.

4. Each day after morning report, the team does work rounds. They take the chart rack and see all the patients as a group. The juniors haven’t seen the patients since the previous day. Much time is spent looking over the chart (while other team members wait), or chasing lab results etc.. Rounds usually take several hours. The housestaff are usually in the hospital until the evening if they attend their scheduled teaching sessions.

5. A resident is doing her first rotation on the CTU. She is working with an intern and two MSIs. She is worried about delegating too much work to the juniors and is carrying approximately one quarter of the patient load. She tries to let the juniors work as independently as possible and sees her own patients during this time. She finds it very frustrating being constantly interrupted by the juniors for help. She is feeling overwhelmed and doesn’t feel on top of things. Yesterday, a junior overlooked an important lab result with a bad outcome for the patient. The staffperson came down heavily on the resident.
QUESTIONS:
What are your objectives for work rounds?
How do you organize your CTU?
Role of the juniors?
Distribution of patients?
Should the resident take patients?
   pros
   cons
   how many
   which ones
Planning ahead?
Pre-rounding by juniors?
Going around as a group?

Tips for Running Efficient Work Rounds

Clear Objectives
-At the end of rounds each person should know enough about all patients so that if the person responsible for primary care is absent, another team member can assume responsibility
-By the end of rounds, everyone should know the tasks that must be accomplished during that day
- They should also know with what urgency these tasks must be completed
- The resident should ascertain whether the students understand how to accomplish their tasks
- New areas for learning for juniors include organizational skills, such as, how to plan their day and how use their time effectively

Plan Ahead
- Hold work rounds early
- Make a work list
- Group and divide the tasks for maximum efficiency
- Meet with team at the end of the day to plan the next day

Pre-Rounding by Juniors
- Insist on pre rounding by interns and students to improve efficiency of work rounds

Clarify Ahead of Time How Much Time Can be Spent Per Patient
- See sickest / most complicated first

Review with team how to do brief presentations

Encourage use of problem lists
Avoid lectures unless few patients
-one to two brief teaching points per patient

In your supervisory role, you should flip through orders and charts for completeness periodically
-Provide students with the importance of documentation
-What should and should not be included in a chart and how to convey information clearly in written format

Delegating Work

CASES:

1. The resident assigns a patient in ER to the intern. He watches over the intern as he takes the history. He interrupts frequently when a question comes to mind, and often takes over the history. The intern gets frustrated and they have a small confrontation. Similarly, during attending rounds, the resident interrupts the juniors while they are presenting and often takes over the presentation.

2. The resident has a strong belief in having MSIs develop a sense of independence. She allows them to see their patients
independently and to make their own decisions and write their own orders. The MSI feels overwhelmed, and often doesn’t understand what should be done for the patient. He feels like there is no safety net.

3. A busy resident tries to make the ward run more efficiently by delegating work. He provides clear plans for each patient and what should be done for each. Early each day, he delegates the tasks that need to be done for that day. The MSIs don’t always understand why things are being done. Among each other they grumble that they are the resident’s “skut monkeys.”

Steps for Effective Delegation

Communication
Describe the framework of the assigned task
Describe the desired results
Ask for commitment
Agree to a timetable and an evaluation plan

Expectations
Expectations must match maturity and skill
If you delegate responsibility...you must also delegate authority
Don’t breathe down their necks
The person delegated to must be made accountable to the delegator
You’re still on the line
While the student is accountable to you s/he is not accountable to the next higher level

One Minute Teaching Skills During Work Rounds

1. Get a commitment
2. Probe for supportive evidence
3. Teach general rules
4. Reinforce what was right
5. Correct mistakes
6. Self directed learning

Cue:
After presenting the facts, the students stops to wait for your response or asks for your guidance
Response:
Ask the student to share what they think about the issue presented by the data

Issues may include coming up with more data, proposing a hypothesis or plan, developing a management plan, figuring out why the patient is noncompliant, deciding on whom to consult, etc.

“Get off the fence”

Rationale:
Asking students for their interpretation of the data assumes, respectfully, that they are processing, as well as collecting data and are engaged as problem solving professionals

Feel in charge - motivation

2. **Probe for supportive evidence**

Cue:
When discussing the case, the student has committed themselves and looks for you to either confirm the opinion or suggest an alternative

You may or may not agree
Response:
Before offering your opinion, ask the student for what evidence they feel supports their opinion
   A corollary approach is to ask what other choices were considered and what evidence supported or refuted these alternatives

Rationale:
Problem solving is dependant on knowledge base
Get an understanding of the thought process
Assess faulty reasoning
Helps avoid, “the right answer for the wrong reason”

3. Teach general rules

Cue:
While discussing the case, you see an opportunity to provide a valuable teaching point
   i.e., You know something about it that the student needs or wants to know
   i.e., Pearls and pitfalls

Response:
Provide general rules, concepts and considerations, and target
them to the students’ level of understanding

Rationale:
General rules are easier to remember
Higher level of understanding for future application
Go beyond the ward routine
   Students can often get by with simply learning the “ward routine” and not fully understanding the principles that underlay them
   Routines often change, principles are more long lasting

4. Tell them what they did right

Cue:
Student has handled a situation in a very effective manner
   They may not realize that the action was effective and had a positive impact

Response:
Take the first chance you find to comment on the specific good work and the effect it had

Rationale:
Some good actions are pure luck while others are deliberate
reinforcement is important in firmly establishing skills / competencies
Don't confuse this with praise

5. Correct mistakes

Cue:
student makes a mistake
Omission or commission

Response:
Discuss what was wrong and how to avoid or correct the error in the future
Allow the student to critique their performance first

Rationale:
Pre-empt mistake from being repeated
excellent teaching opportunity - learning from mistakes
Help students develop ability for self assessment and admit mistakes

6. Self directed learning
Cue:
While discussing the case, you see an opportunity to provide a valuable teaching point
   You may or may not know the answer
   If there is no urgency to act on the answer

Response:
Assign the task for the student to “look up”
When you assign a topic to look up make it understood that you will follow-up
   Give a time frame of when you expect the answer
   Reserve five minutes of the beginning of the next days work rounds for the answers
   If the student has not done the work, reassign the task with a clear understanding that these tasks are important and that you will follow up

Rationale:
Motivating self directed learning is one of the most important tasks that you can do as clinical teacher
Remember from last weeks session
Especially encourage self initiated tasks and contributions
Microskills Role Play: One Minute Teaching Skills

INSTRUCTIONS:
One student, one preceptor and the rest observers
Use scenarios and advise residents to use as many of the
microskills as they can

1. & 2. should be used all the time
the rest according to the situation

The observers should take brief notes on the dialogue and
responses. What microskills are being used?

After completing the simulation allow the preceptor to critique
themselves, then the students, then the observers

SCENARIOS:

1.
Student presentation:
HB is a 65 yo woman with a history of CHF presents with a 2
day history of increasing SOB. She had a “cold” last week and
was feeling unwell. She thinks she may have had a fever, but
she didn’t take her temp. She also had some cough with a
small amount of yellowish sputum. She sleeps on 3 pillows at
night and said she had difficulty sleeping last night because of SOB, so she came into ER today.

Her CHF is usually well controlled with dig, Lasix, and Captopril. She is compliant with her meds. She's never been hospitalized for CHF before and her history is otherwise unremarkable.

O/E
P 110, BP 160/90, R 30, T 38
JVP 6 cm ASA, + HJR
Crackles to the base of the scapula
+ S3
SOA

The remainder of the Px was unremarkable

Student commitment:
I think she has an exacerbation of CHF

Student supporting evidence:
Sign of fluid overload
A corollary approach is to ask what other choices were considered and what evidence supported or refuted these alternatives
General rule:
e.g., SOB can be CVS or lung or both
e.g., CHF is not a dx - what was the precipitant

2.
Student presentation:
RU is a 70 yo man who presents with a first episode of collapse. He was working in his garden, felt “funny” for a few seconds. And the next thing he remembers is waking up. There was no witness and he doesn’t know how long he was out for. He doesn’t remember any palpitations or chest pain but his PMH is positive for cardiac disease with a previous MI 3 yrs ago. He also has a hx of hypertension. His medications include a beta blocker and ECASA.

O/E
P 70 regular, BP 155/90, R 12
Chest- clear
CVS - JVP 2 cm ASA, precordium unremarkable, HS normal, no murmurs, no SOA
CNS- grossly normal

The remainder of the Px was unremarkable
Student commitment:
I think he had an arrhythmia

Student supporting evidence:
His cardiac history is suggestive of the possibility of a cardiac cause. The px is often normal between bouts of arrhythmias. A corollary approach is to ask what other choices were considered and what evidence supported or refuted these alternatives

General rules:
e.g., Importance of pre, during, and post as an approach to collapse
e.g., Similarities of syncope and seizure

3.
Student presentation:
SO is a 60 yo female admitted 3 days ago with coffee ground emesis secondary to NSAID use. She was transfused a total of 3 units and her Hb is now 105. Her OGD revealed erosive gastritis and she was started on IV zantac. Overall she seems to be doing well but the nurses have commented that she is more confused. I saw her this morning and she didn't know who I was. I did a quick px and could find anything.
Student commitment:
I think it may be a combination of her GI bleed and the unfamiliar environment.

Student supporting evidence:
Well, I couldn't find anything suggestive on the px
A corollary approach is to ask what other choices were considered and what evidence supported or refuted these alternatives

General rule:
e.g., Causes of acute confusion in the elderly

4.
Student presentation:
JK is the 27 yo female IVDU who came in with leg cellulitis. Her blood cultures remain negative and she is on day 4 of IV cloxacillin. Her withdrawal is being controlled with p.o. clonidine and her BP is 105/70. Yesterday, she developed some SOB, so I gave her some O2 and a Ventolin mask. She improved and she looks good this morning.

Student commitment:
I thought she might have a touch of asthma
**Student supportive evidence:**
She improved with treatment

A corollary approach is to ask what other choices were considered and what evidence supported or refuted these alternatives

**Mistake:**
Possible DVT & PE
Possible SBE & PE

**General rule:**
e.g., It's unusual for someone to develop asthma for the first time while in hospital
e.g., If a patient develops a new problem while in hospital, you should think of possible complications of the presenting complaint
e.g., Bedridden patients are at risk for DVT

5.
**Student presentation:**
OD is a 63 you man with a longstanding history of COPD. He was admitted 2 days ago with an exacerbation of COPD secondary to a URI. We put him on nebulized Atrovent and Ventolin, and gave prednisone 40 mg OD. When I saw him this
morning, he was more tachypneic, so I upped his O2. Although his RR is improved, he is more confused.

**Student commitment:**
I think his COPD is getting worse and I think that he may need to be intubated

**Student supportive evidence:**
His decreased RR may mean that he is going into respiratory failure. His confusion is in keeping with decreased O2 to the brain.

**Mistake:**
Likely COPDer with CO2 retention; needs hypoxic drive to breathe

**General rule:**
e.g., Don’t use more than 28% O2 unless you know patient is not a CO2 retainer
e.g., CO2 retainers need their hypoxic drive to breathe
TASKS FOR THE WEEK

-Before each workround, review the “One minute teaching skills”
-Use 1. & 2. for every Student / Patient encounter (i.e., “Get a commitment” and “Probe for supportive evidence”)
-Try to teach on short general point on most patients (i.e., 3.)
-Use 4. & 5. where appropriate (i.e., “Reinforce what was right” and “Correct mistakes”)
-Assign “Self directed learning” tasks
  -Use these relatively sparingly (i.e., no more than 1-2/day)
  -Give a time frame of when you expect the answer
-Follow up
Session 3 - Feedback and Evaluation

Agenda

1. Review of Last Weeks Tasks
2. Feedback vs. Evaluation
3. Feedback: The Psychological Meaning
4. Content of Effective Feedback
5. Role Play: Evaluation & Feedback
6. Managing Mistakes
7. Tasks for the Week

Review of Last Weeks Tasks

- Before each workround, review the “One minute teaching skills”
- Use 1. & 2. for every Student / Patient encounter (i.e., “Get a commitment” and “Probe for supportive evidence”)
- Try to teach on short general point on most patients (i.e., 3.)
- Use 4. & 5. where appropriate (i.e., “Reinforce what was right” and “Correct mistakes”)
- Assign “Self directed learning” tasks
  - Use these relatively sparingly (i.e., no more than 1-2/day)
-Give a time frame of when you expect the answer
-Follow up

Feedback vs. Evaluation

QUESTIONS:
What is feedback?
What is evaluation?
How do they differ?

Distinct from evaluation, feedback presents information, not judgement.
Evaluation is expressed as normative statements, peppered with adverbs and adjectives; feedback is neutral, composed of verbs and nouns.

QUESTIONS:
Praise & Criticism
How do these differ from feedback and evaluation?
Try to avoid confusing positive feedback with complimenting, and negative feedback with criticism.
If a resident feels let down by a student they may wish to criticize the student rather than provide feedback.
Try to avoid the incessant use of “good”, “excellent”, “that’s perfect”, responses to trainees every statement that approximates a correct answer.

Feedback

“Feedback”
The term feedback was originally used by rocket engineers in the 1940’s
  Servo-mechanism
  Goal seeking
  Another example: thermostat

“Feedforward”
Taken for granted that “target” is known
Students complain that at the start of the rotation they are not told what is expected
Feedforward refers to prior specification of criteria so that students know what to aim for
Giving feedback
Set a goal (target)
What did the learner do right that you want them to do again - tell them
What did the learner do wrong that needs to be changed - tell them

Successful coaches
Many successful coaches and managers were not "hall of famers"
Perhaps because they were less gifted athletes who worked hard to master the necessary skills to do well, they can identify with and teach others trying to accomplish the same thing
Effective learning can take place when the subject matter is difficult to learn, if the teacher can show learners their major areas of weakness, and motivate them to change

Feedback:: The Psychological Meaning

QUESTIONS:

1. What is the capacity of feedback to elicit an emotional
reaction?
2. Which do you think is more effective positive or negative feedback?
3. What happens when you provide only negative feedback?
4. What happens when the student comes to associate feedback with criticism?
5. How does it affect you as a teacher if you've had bad experiences with "feedback" as a learner?

Negative judgement is common on all levels of medical education; direct feedback, which sites specifics and offers suggestions for improvement, is rare.

Like adults who were scolded more than they were instructed as children, physicians have difficulty discerning the differences between describing behaviour and labelling the person "good" or "bad". Because clear feedback is rare and correction is more common than affirmation, the medical trainee has difficulty feeling competent. Receiving punishing comments about mistakes teaches trainees to hide errors, by lying, if necessary. Like emotionally abused children, residents become unwilling to risk the pain they have come to associate with close supervision.
The absence of honest constructive feedback and the overabundance of placing blame in medical education perpetuates physicians perfectionism and leaves them at risk for impairment. (Mckegney, 1989)

The capacity of feedback to elicit an emotional reaction
Experiences with feedback that was handled poorly, in which the technique for limiting the emotional reaction were appreciated, may inhibit giving, or receiving, feedback in the future
The teacher may be concerned the student will be hurt by negative feedback; that it will damage the student/teacher relationship, or the teacher's popularity; that it will result in more harm than good
The student may view feedback as a statement about his or her personal worth or potential
Students may ostensibly want information about their performance but only in so far as it confirms their self concepts

In this sense, they want feeding not feedback

In one longitudinal study, house officers confirm the near total absence of feedback from attending physicians
To fill this void, the house officers generated a system of self validation, largely based on unintended cues
Their system developed in tandem with their own sense of mastery.
As they began to feel more and more confident, they also began to feel more capable of judging their own performance. Unfortunately, their system of self evaluation excluded evaluation from external sources.
In fact, much to the amazement of the investigators, the house officers seemed to employ a whole barrage of defences for dealing with criticism from superiors.
   They disparaged the source.
   They regarded the issues as irrelevant.
   They attributed the criticism to difference in style.
Or, they concluded that criticism was no longer relevant to their current level of performance.

The problem is that their educational environment had failed to provide them with a model for constructive, nonevaluative performance appraisal.

When feedbacks fails, it is usually because it led to anger, defensiveness, or embarrassment on the part of the trainees.

Most of us experience some discomfort giving and receiving feedback
Because of that, we may in the teacher role transfer those
feelings to the learner, and be reluctant to provide feedback. Try to avoid association of feedback with negatives. Don’t internalize feedback, it does not mean you are a bad student.

When a person feels criticized his energy may go into self-protection rather than self-improvement
Importance of not belittling when wrong.

Positive Feedback
Good performance is expected and taken for granted.
Catch them doing something right.
Do not wait for perfect behaviour to give positive feedback, but give positive feedback as you observe any step in the right direction.
Positive feedback is a more powerful motivator than negative.
Positive feedback may make a person feel good, which is rewarding, but it also should be informative.

Content of Effective Feedback

“12 Steps to Effective Feedback”

1. Well-Timed:
The closer to the performance the better

2. **Two Way Communication:**
Sharing of information
   
   Gives the student an opportunity for self evaluation

3. **Ownership:**
Begin with an I statement
   
   Based on first hand observation, not on hear say
   Subjective data should be labelled as such

4. **Descriptive Rather than Evaluative**
Describe, do not label

5. **Focused on Behaviour Rather than on the Person or Personality**
Focus on the behaviour, don’t make assumptions regarding motives or intent
Behaviour must be changeable

6. **Specific Rather than General**

7. **Balanced:**
Provide both positive and negative comments
8. Rapport:
Based on trust, honesty, and concern
   Both on the same side
   Common goals: Quality patient care / learning

9. Stop and Listen:
Resistance means non-receptiveness
Understood: have the receiver try to rephrase the feedback

10. Agreement of Others:
When feedback is given in the presence of others, both giver and receiver have an opportunity to check with others in the group about the accuracy of the feedback

11. Avoid Overload:
It involves the amount of information the receiver can use rather than the amount he would like to give

12. Be Brief:
Say it once
1. **Well-Timed: The Closer To The Performance The Better**

**TASK:**
Give good and bad examples

Timing of feedback is critical
- Immediate is best
- It may be preferable to delay if there is a need for privacy
- If either person is upset, it is recommended that some time pass so that emotions can settle

2. **Two Way Communication: Sharing of Information**

Clarify the goals of the feedback session itself
Provide opportunities for mutual problem solving
Give the student an opportunity for self evaluation
Demonstrate responsiveness
- Begin with the learner
- Ask the student for their assessment
- This shows willingness to listen

The trainee should take an active part in the process; the
teacher's open-ended questions can help break the ice
   For example, an attending physician, after hearing a student's presentation may begin by asking "How do you think it went?"

3. Ownership: Begin With an I Statement

Based on first hand observation, not on hear say
When included as part of the feedback, subjective data should be clearly labelled as such
   "I" statements

TASK:
Give good and bad examples
4. Descriptive Rather Than Evaluative

The language of feedback is descriptive and nonevaluative. Statements like “The differential diagnosis did not include the possibility of tuberculosis” are preferable to “Your differential diagnosis is inadequate.” Describe, do not label.

---

**TASK:**
Give good and bad examples

---

**Examples**

You interacted poorly with that patient. When you were talking with Mrs. Jones, you did not make eye contact.

You did a good job with Mr. Adams. Asking Mr. Smith to repeat your instructions about taking his medications was a good patient education technique.
5. Focused on Behaviour Rather Than on The Person or Personality

Focus on the behaviour, don’t make assumptions regarding motives or intent

The information that is fed back to the trainees should deal with actions, not interpretations or assumed intentions.

This allows for psychological distance.

For example, “The antibiotic regimen chosen did not provide coverage for enterococcus”, is less likely to offend than would, “Your choice of antibiotic indicates a lack of appreciation for the possibility of enterococcal infection.”

Focus on the decision not the decision maker.

Behaviour must be changeable

Personality traits, unless they are manifested in behaviours that can be observed and reviewed, are not appropriate for feedback.

If behaviours are observed that are not within the trainee’s power to change, these should not be included as feedback.
TASK:
Give good and bad examples

6. Specific Rather Than General

The information should deal with specifics, making use of real examples.
Generalizations, such as references to the trainee’s organizational ability, efficiency, or diligence, rarely convey useful information and are far too broad to be helpful as feedback.

TASK:
Give good and bad examples

7. Balanced: Provide Both Positive and Negative Comments
8. Rapport: Based on Trust, Honesty, and Concern

Both on the same side
Common goals: Quality patient care / learning

Task:
Give good and bad examples


Understood: have the receiver try to rephrase the feedback
While giving feedback, if you feel resistance, it is best to stop and listen. If the learners become resistant, they stop listening and begin thinking about their responses. By being alert to nonverbal cues of inattention, you can stop and allow the learner to respond.

Task:
Give good and bad examples
10. Agreement of Others:

When feedback is given in the presence of others, both giver and receiver have an opportunity to check with others in the group about the accuracy of the feedback.

Task:
Give good and bad examples.

11. Avoid overload:

It involves the amount of information the receiver can use rather than the amount he would like to give.

12. Be brief: Say it once.

Other Tips for Giving Feedback

"Feedforward"
Let students know what is expected.
Solicited feedback is best
Feedback works best when it is solicited rather than imposed
Take advantage of students' requests

Sensitivity to your values
If an answer has no right or wrong answer, then be sensitive to your values, and do not impose them on the learner
"My way to skin a cat"

"Ego sandwich"
i.e., "Good / Bad / Good Sandwich"
Avoid the bologna sandwich
Don't sandwich negative feedback in between too many accolades or the person may not hear the reprimand

Role Play: Evaluation & Feedback

INSTRUCTIONS:
Resident gives feedback to their current MSI
Another resident takes on role of MSI
Other residents use checklist to determine effectiveness of feedback
Debriefing

"MSI" first
Resident second
Checklist last

Managing Mistakes

Can you picture that the experience of most medical students and residents is that disclosing their needs is punished, while hiding their needs is rewarded? In other words, medical students and residents often find that they are treated better when they appear competent, even when they are not.

Goethe (1991)

The most fruitful lesson is the conquest of one's own error. Whoever refuses to admit error may be a great scholar but he is not a great learner. Whoever is ashamed of error will struggle against recognizing and admitting it, which means that he struggles against his greatest inward gain.
Managing Student Mistakes

Step One:
Create an atmosphere that is nonthreatening and nonjudgemental, so that open discussion of mistakes can occur

Step Two:
Ensure that supervision is adequate so that errors are detected

Step Three:
Determine the cause of the error
   Every attempt should be made to separate the action (mistake) from the person

Step Four:
Determine a course of action for remediation
   For the patient
   For the student
Inconsequential mistakes can be used to demonstrate what needs to be done should a serious error occur
Students need to learn to recognize their limits, learn to ask for help and how to get it

Step Five:
Address the emotional needs of the learner
Conducive to emotional support
Help students deal with distress and guilt

Tasks for the Week

1. Sit down with your MSIs for a formal feedback session - use the “12 Steps”
2. Use informal feedback constantly - keep track of examples
   Feedforward
   Have the group provide feedback to each other
Session 4 - Questioning and Non-Facilitating Teaching Behaviours

Agenda

Review of Last Week’s Tasks
Introduction
Levels of Questioning—“KAP”:
   Knowledge, Application, & Psychomotor Skills
Questioning Techniques
Microteaching: Questioning
Six Common Nonfacilitating Teaching Behaviours
Reflection Exercise: Nonfacilitating Teaching Behaviours
Tasks for the Week

Review of Last Week’s Tasks

1. Sit down with your MSIs for a formal feedback session - use the “12 Steps”
2. Use informal feedback constantly - keep track of examples
   Feedforward
   Have the group provide feedback to each other
Introduction

True learning begins by not knowing the answer. Questioning is an activity that is all too often interpreted by students or designed by instructors to be akin to the inquisition. "Pimping"

Instructors can use questions to lead students through all levels of thinking, from simple remembering to high level critical thinking. Unfortunately, however, all too often the focus of the questioning is at the simplest level - asking students only to remember and repeat what they have learned.

Levels of Questioning - "KAP": Knowledge, Application, & Psychomotor Skills

Mnemonic: "KAP"

Knowledge: Remember
Application: Understand
Problem Solve: Analyse, synthesize, evaluate

Same mnemonic as CAP: Cognitive Affective Psychomotor
“Fact” questions are of even lower level
   e.g., What was the Hb today?
   e.g., What was the urine output?
This is by far the most common type of question asked
by residents!!

TASK:
Give examples of each type of question on the following topics
   Captopril
   COPD
   CHF
   etc.

“double barrel”
   One strategy for teaching is to give the students new
knowledge (i.e., a fact) and immediately ask a follow-up
question that requires application or another higher
level

Questioning Techniques

Questioning

Begin With Assessment
If you are not aware of the learner’s current knowledge, attitude and skills, teaching may be inefficient and unproductive. Through questioning you can find out what the learners’ do and don’t know so you can aim instruction towards what they don’t know. This also “activates” prior knowledge. The difficulty with assessing knowledge is that the students and residents may feel that they are being tested.

Eliciting Questions

Eliciting questions are used to start a discussion. Like a good history, it is often better to start with an open ended question, then move in with more closed questions. When you move onto a new topic, start with an open ended question again. Think of using open and closed questions as like playing the accordion.

If the response to the eliciting question is incorrect, incomplete, inappropriate or disorganized, the instructor has an option. They can utilize probing questions to guide the student to the desired response, or they can correct, complete, clarify or organize the
answer for the student.

Probing Questions
Probing questions are designed to lead students to the articulation of the correct or more appropriate response and aid the instructor in determining depth of student's comprehension.

Probing questions are more likely to be necessary with higher order questions.

There are five categories of probing questions:

1. Prompting
2. Justification
3. Clarification
4. Extension
5. Redirection

1. Prompting.
Follow up Q(s) with hints or cues

Instructor follows-up a student’s initially weak or incorrect answer with another question or series of questions containing hints or clues.
Can often trigger the student’s thinking.
Can also be used to encourage and support a student who is reluctant to answer because he is afraid.

TASK:
Give examples of prompting questions

2. Justification.
“Why?”

Asks the student to give the reason for his particular response or to explain why he chose to respond as they did. This permits the instructor to determine the student’s perception and understanding of his own answer. Allows one to assess a faulty reasoning strategy. Often, it is important for the student to have not only a correct response to a question, but also to understand why that response is correct.

“The right answer for the wrong reason”

TASK:
Give examples of justification
3. Clarification.
Rephrase / explain (i.e., no hints or clues)

Useful when the student has given a poorly organized or incomplete (not incorrect) response.
No hints or clues are added.
You simply ask the student to rephrase or explain the response.

TASK:
Give examples of clarification

4. Extension.
Elaboration / detail

Both clarification and extension questions are used to keep the students on the same train of thought, but to make certain points more explicit and complete.
Extension questions asks the student to elaborate on a correct response by providing additional information or more detailed explanation of the answer.
TASK:
Give examples of extension

5. Redirection.
Involve another student

Asking the same question of another student.
This increases student interaction.
This increases wait time and therefore indicates to students
that they should not turn off their thinking because somebody
else has answered the question.

TASK:
Give examples of redirection

Microteaching

INSTRUCTIONS:
Each resident will assume that the other residents are students
and teach a topic of their choice using the Socratic Q-A method (5 min each).

Six Common Nonfacilitating Teaching Behaviours

1. Insufficient "Wait Time"

Students who note that the instructor answers a preponderance of his own questions without waiting for a response, soon grow dependent upon the teacher to do their thinking for them.

2. The Rapid Reward

Similar effect to insufficient wait time. Learning is a highly individualistic process, people learn at different rates and in varying ways. Rapid acceptance of a correct answer favours the fast thinker or speaker who has completed his thought process; those in midthought are terminated prematurely. To ameliorate this situation, encourage student to student dialogue, discussion, and peer critiquing of each others’ ideas.
3. The Programmed Answer

E.g. Look at this shrub and tell me, what observations you can make? Do you see the dead stems? Are they damaged from insects feeding?
The programmed answer not only deprives the respondent of expressing his own thoughts by steering him towards the answers that the questioner expects, but also conveys the message that there is really little interest in what he thinks or says.

While programming can be an effective tool when one desires to guide students' thinking, suggest possibilities, or model logical thought processes, it is important to be aware of its limiting effects in opening up a wide variety of possible ideas.

4. Nonspecific Feedback Questions

Many instructors feel justified in assuming that their students have no questions if no one responds when they ask, “Are there any questions? Do you all understand?”

What type of student will bravely call attention to his own ignorance when the question is posed in such a way?
5. The Teacher's Ego Stroking and Classroom Climate

Students need to feel that it is psychologically "safe" to participate, to try out ideas, to be wrong as well as right.

6. Fixation At Low Level Of Questioning

Skillful teachers use questions to guide thinking as well as test for comprehension. Too often, however, questions become fixated at the informational level, requiring students only to recall bits and pieces of a rote memorized data. Remember "KAP"

REFLECTION EXERCISE:
Now that you are familiar with non facilitating teaching behaviours, review the teaching that you did in the task above.
   Critique your teaching for non facilitating teaching behaviours.
   Now give the others a chance to critique your teaching.
Tasks for the Week

1. Learn the mnemonic KAP (Knowledge, Application, Problem Solving). Reflect while you are teaching: are you fixed at a low level of questioning? Try to move to higher levels.

2. Use the 5 types of probing questions rather than answering your own questions when a student doesn’t know or gets the wrong answer.
   1. Prompting
   2. Justification
   3. Clarification
   4. Extension
   5. Redirection

3. Review the list of non facilitating teaching behaviours. Catch yourself using them.
Session 5 - Cognitive Learning Principles and Problem Solving

Agenda

Review of Last Week’s Tasks
Cognitive Learning Principles
   Discovery Learning Exercises
   Reflection Exercise
Problem Solving Strategies
Tasks for the Week

Review of Last Week’s Tasks

1. Learn the mnemonic KAP (Knowledge, Application, Problem Solving). Reflect while you are teaching: are you fixed at a low level of questioning? Try to move to higher levels.
2. Use the 5 types of probing questions rather than answering your own questions when a student doesn’t know or gets the wrong answer.
   1. Prompting
   2. Justification
   3. Clarification
   4. Extension
   5. Redirection
3. Review the list of non facilitating teaching behaviours. 
Catch yourself using them.

Cognitive Learning Principles

Introduction

How does learning actually occur?

TASK:
Memorize the following text - give approx. 1 min.

Nobody tells productions when to act; they wait until conditions are ripe and then activate themselves. By contrast, chefs in the other kitchens merely follow orders. Turing units are nominated by their predecessors, von Neumann operations are all too scheduled, and LISP functions are invoked by other functions. Production system teamwork is more laissez-faire: each production acts on it's own, when and where it's private conditions are satisfied. There is no central control, and individual productions never directly interacts. All communication and influence is via
pattern in the common work space - let the anonymous "To whom it may concern" notices on a public bulletin board.

It may of course be possible to learn this text by heart, provided that there is enough time for repetition. An important component of actual learning is that the topic is understood. This may not have been difficult for people with extensive knowledge of computer programming and artificial intelligence.

What is the problem?

An important component of learning is that the studied topic is understood. Those with an understanding of computer science, especially artificial intelligence, will have no problem with the above text.
Principle One

The prior knowledge people have regarding a certain subject is the most important determinant of the nature and amount of new information that can be processed.

See example above
Knowledge cannot actually be transferred but the pupil has to master it.
The reason for this is that the already available cognitive structures that can be found in the pupil limits the extent in which he can understand new information.

Principle Two

TASK:
Memorize the following text - give approx. 1 min.

A newspaper is better than a magazine. A seashore is a better place than the street. At first, it is better to run than to walk. You may have to try several times. It takes some skill but it is easy to learn. Even young children can enjoy it. Once successful, complications are
minimal. Birds seldom get too close. Land however, soaks very fast. Too many people doing the same thing can also cause problems. One needs lots of room. If there are no complications, it can be very peaceful. A rock will serve as an anchor. If things break loose from it, however, you will not get a second chance.

The availability of relevant prior knowledge is a necessary, yet not sufficient, condition for understanding and remembering new information. Prior knowledge also needs to be activated.

Subjects having studied this text with the accompanying title “Making and Flying a Kite”, afterward, remembered almost twice as much information than those who studied the text without the title.

Regular education, does however, know quite a lot of examples in which people do not seem to be able to relate new information to what they already know about certain subjects.

Principle Three

Knowledge is structured in a certain way within memory.
That structure makes it more or less accessible to be used. Knowledge consists of propositions that are structured in semantic networks. A proposition is an allegation that contains two concepts and their interrelation.

Semantic networks consists of large amounts of propositions
that relate to each other. They are idiosyncratic, and they structure knowledge that a person already has about a part of reality and at the same time being structure in reality as it is. Knowledge that is structured in a semantic network should absolutely not be confused with book knowledge. It is a reflection of a person’s experiences, views, and ideas. It may contain inaccuracies, obscurities, and generalities. It will be obvious that the detailed composition of such a knowledge structure, a large amount of relations between concepts and the way in which the structure is made, will strongly influence that what may be done with that knowledge.

**Principle Four**

**TASK:**
Without using any “tricks”, memorize as many as possible of the following pairs:

Paired associate tasks
When you are presented with the first word, you will be expected to reproduce the second (i.e., write it down) - allow 30 sec.
dog       bike
school    crow
chair     flower
man       house
computer  pail
TV        candle
pillow    disc
book      curtain
plant     frame
ice       paper

Now, memorize the second list. This time, however, establish an association between the two elements - allow 30 sec.

sink      car
CD        picture
paper     blanket
wire      box
plug      chair
lamp      pig
pen       stamp
owl       shirt
helmet    phone
box       window
Remembering information and recalling information from one's memory can be strongly improved when elaboration on material takes place in the learning phase. The second pair elements supposed to be associated with the first in the subjects' memories. The other half was to do the same task, it was advised to actively establish, with every pair, relations between the two components.

Researchers called this active way of dealing with learning material elaboration because the pupil "dwell" on the relation between two concepts.

According to the researchers this approach is so successful because the elaboration within the resulting semantic network creates multiple redundant retrieval paths. This facilitates the retrieval of a concept in the memory, which is necessary because there are several ways to find a certain concept.

  e.g., Flash cards

Most of the learning comes from making the flash cards not from their subsequent use

Purchased flash cards are therefore much less effective
Principle Five

The ability to activate certain knowledge in the long term memory and to make it available for use depends on context.

An interesting paired associate task

One half of the group learned the list under water in a pool, whereas the other half worked on the edge of the pool.
Subsequently, half of the subjects studying under water were taken out of the pool and half of those on the edge were placed in the pool.
Those subjects who did the memory task in the same surroundings, as in which they had learned the word list, achieved considerably better scores.

It is apparent that information which is intentionally learned and information about context are simultaneously stored in a person’s memory (even if the context is absolutely irrelevant to the learning task).
This process facilitates retrieval of that information later on, that is, if that knowledge can be recalled within the same context!
Contextual dependence on learning
e.g., can’t remember who someone is out of context
e.g., can’t remember what was studied at home when you get
to the exam - different environment, different stress level, etc.

**Principle Six**

To be intrinsically or extrinsically motivated to learn, prolongs the amount of study time (or to put it in cognitive terms: the processing time) and subsequently improves achievement. Hence, there is a linear relationship between the time spent on processing the subject matter and the achievement.

In intrinsic motivation, the inclination is aimed at understanding the subject matter.
Extrinsic motivation is characterized by the fact that the subject matter is studied, not for a purpose in itself, but to achieve other objectives, such as passing an examination, obtaining a degree certificate, increasing self confidence, or having a well paid job.

**Conclusions**

By means of the above given principles, a distinction between roughly three different learning processes can be made.
1. Accretion of existing semantic networks by means of adding new information
   Activation of prior knowledge has an important part in this process.

2. Restructuring of those networks under the influence of new information, for instance, when the pupil is confronted with facts that conflict with propositions in the existing network
   Here, the determining cognitive mechanism is elaboration: producing hypotheses that can give new content to both old and new information
   What is considered to be an important facilitating factor, is the confrontation with problems that challenge someone to think of new explanations

3. Tuning of available information in the context in which that information has to be applied
   In the above, it has already been stated that activation of prior knowledge is context restricted
   Knowledge activation in various situations in which that knowledge is applicable, is a way to conquer that restriction
   It can be called tuning by facilitation or generalization
   Important to associate acquired knowledge with specific practical conditions in which that knowledge can be used.
TASK:
Consider the above 6 cognitive principles:

1. Amount of prior knowledge
2. Activation of prior knowledge
3. Construction of semantic networks (propositions between two elements)
4. Elaboration ("dwelling")
5. Learning (and remembering) in context
6. Motivation and time spent

What circumstance in medical education work for or against effective learning?
How can we facilitate effective learning?

Problem Solving Strategies

The Four Strategies of Clinical Diagnosis

Sackett, Haynes, & Tugwell (1985)

1. Exhaustive Approach
Most common method used by medical students
“My little pony” method

2. Gestalt Method
   “Aunt Millie” approach
   Pattern recognition

3. Algorithm
   “Recipe” method

4. Hypothetico-Deductive Method
   Problem solving

Importance of checking process and not just endpoint
   i.e., steps in hypothetico-deductive reasoning
Making other learners aware of the clinical reasoning process
so that intuitive problem solving abilities can be developed.

Introduction

There is no general consensus to what it means to problem solve.
Education research negates the possibility of an underlying problem solving skill which is widely generalizable.
Knowledge is the most important factor in problem solving
ability.
Although we may not be able to specifically teach problem solving, we can provide students with practice.

View the Skill From the Learner’s Point of View

Yvan Binette, a Quebec dogsled driver commented that, “To get a dog to run for you, you have to be real friendly. You have to think like a dog. You have to lie down on all fours to see what the world looks like to a dog...”

Become consciously competent

Problem Solving Session - Why?

1. Why versus What (i.e. The greater importance of why a question is asked, rather than what the answer is)
2. The right answer for the wrong reason
   Why is that the right answer?
3. Assess faulty reasoning strategies
   Why is that important?
   Why would you do that?
Two Most Effective Techniques for Teaching Problem Solving

1. "Why?" Questions
Students should be challenged by asking them to support, justify, and defend their answers.

2. "Model" Problem Solving Skills
Think out loud
Explain your "why"
Become consciously competent

Clinical Reasoning Process Can be Divided Into Five Behaviours

It is recommended that you point out these behaviours in a learner centred discussion as they occur so as to bring these to a conscious level.

1. Information perception and interpretation
2. Hypothesis generation
3. Enquiry strategies
4. Problem formulation
5. Diagnostic and or therapeutic decisions
Tasks for the Week

1. Memorize and apply the "Cognitive Learning Principles"
   1. Amount of prior knowledge
   2. Activation of prior knowledge
   3. Construction of semantic networks (propositions between two elements)
   4. Elaboration ("dwelling")
   5. Learning (and remembering) in context
   6. Motivation and time spent
Take advantage of these in the way you approach your teaching.
Reflect during your teaching (i.e., reflection-in-action) and report back next week.

2. Use the following techniques for teaching problem solving
   A. "Why ?" questions
      Students should be challenged by asking them to support, justify, and defend their answers
   B. "Model" problem solving skills
      Think out loud
      Explain your "why"
      Become consciously competent
Session 6 - Small Group Teaching

Agenda

Review of Last Week’s Tasks
Introduction / Objectives
Teacher & Session Characteristics
Group Discussion Teaching Techniques
Managing Group Dynamics
Program Evaluation Forms

Review of Last Week’s Tasks

1. Memorize and apply the “Cognitive Learning Principles”
   1. Amount of prior knowledge
   2. Activation of prior knowledge
   3. Construction of semantic networks (propositions between two elements)
   4. Elaboration (“dwelling”)  
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   A. "Why?" questions
      Students should be challenged by asking them to support, justify, and defend their answers
   B. "Model" problem solving skills
      Think out loud
      Explain your "why"
      Become consciously competent

Introduction / Objectives

Effective Instruction

Effective teachers generally accomplish certain events of instruction:

1. Begin a session of a short review of previous prerequisite learning
2. Follow with a short statement of goals for the session
3. Present new material in relatively short steps with learner practice after each step
4. Give clear and detailed explanations
5. Ask many questions and obtain responses from all learners
6. Guide learners during initial practice
7. Provide a high level of successful practice
8. Provide systematic feedback and constructive criticism to each learner

TASK:
Discuss the “organization” of the Resident Education Teaching sessions and compare to the model.

Robert Segal says that the group discussion leader serves as a midwife to students pregnant with ideas. Thus, a good discussion leader does not direct or convey what he knows, but uses what he knows to convey to students what they themselves already know or can learn.

Objectives

“CAP”
Cognitive
Affective
Psychomotor
Cognitive Objectives, Bloom (1956)

Recall from the last session:

"KAP" - Knowledge; Application; Problem Solving

Below is a more detailed breakdown

From the lowest to highest levels

1. Knowledge
2. Comprehension
3. Application
4. Analysis
5. Synthesis
6. Evaluation

TASK:
Get the residents to brainstorm on the best method for achieving each of the cognitive objectives, making them realize that more and more active participation is required with increasing levels of objectives and also that each subsequent level builds on prior ones.

The lowest level of knowledge can be taught in lectures but not suitably in group discussions.
The lecture becomes less effective with the successively higher levels of cognitive learning.

At best, a teacher in the lecture can model comprehension, application, analysis, synthesis and evaluation.

However, for the students really to reach these objectives a more active role is needed.

Here is where the group discussion can be an effective teaching method.

Of course, knowledge is a prerequisite for achieving these higher level objectives.

Often group discussions are a disappointment because students lack basic knowledge.

Thus, a lecture followed by a group discussion can be an effective combination.

If a lecture is not feasible then a reading assignment can be used as a source of preparatory knowledge.

Lectures are very limited in the affective domain.

People need to develop their own understanding of the need for change with an awareness of how they feel about it and what can be done about those feelings.

In the words of the 19th century, New England transcendentalist, A. Bronson Alcott, "The true teacher defends his pupils against his own personal experience."
Teacher & Session Characteristics

Teacher Characteristics

Teacher behaviour is associated with successfully leading a group discussion

1. An innate ability in, and belief in the value of, using interpersonal interaction as a teaching modality
2. A capacity for professional intimacy, and
3. An ability to measure and modify the tension level of the learner group so as to enhance the learning process

In a group discussion, the leader must give up some control over the teaching process and its outcome.

Share the leadership

A willingness to pause while learners deal with their own agendas.
Tolerance of, and empathy for, the opinions and values expressed.
Nonjudgemental acceptance of learners' statements and opinions, without implying that all statements are correct.
Session Characteristics

Group discussions can be labelled according to whether they are:

- Teacher centred
- Group centred
- Learner centred

— A continuum —

Based on six characteristics:
1. The amount of leadership and direction required of the teacher
2. The amount of responsibility for the educational outcome to be assumed by the teacher
3. The degree to which the teacher is responsible for rewarding and reinforcing the learning that occurs
4. The level of knowledge of the particular subject required of the learner
5. The dominant style of interaction among the participants
6. The specific techniques of teaching used by the learner
TASK:
Create a matrix with the left hand column including the six characteristics described above and teacher centred, group centred, and learner centred as the titles of the three columns.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Teacher-Centered</th>
<th>Group-Centered</th>
<th>Learner-Centered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Amount of leadership from teacher</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>2. Degree of responsibility by teacher for outcome</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>3. Amount of reinforcement of learner required of teacher</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>4. Previous level of knowledge of subject required of learner</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>5. Dominant Style of interaction</td>
<td>Teacher directed</td>
<td>Mutual Problem Solving</td>
<td>Open-Ended</td>
</tr>
<tr>
<td>6. Specific technique of teaching</td>
<td>Question &amp; Answer</td>
<td>Brainstorming</td>
<td>Case Based Reasoning</td>
</tr>
</tbody>
</table>
Group Discussion Teaching Techniques

Questioning

Begin With Assessment
“dx the learner”
“activate” prior knowledge

Eliciting Questions

Probing Questions
1. Prompting
   • Follow up Q(s) with hints or cues
2. Justification
   • “Why ?”
3. Clarification
   • Rephrase / explain (i.e., no hints or clues)
4. Extension
   • Elaboration / detail
5. Redirection
   • Involve another student(s)

Nonfacilitating Teaching Behaviours
1. Insufficient “wait time”
2. The rapid reward
3. The programmed answer
4. Nonspecific feedback questions
5. The teacher’s ego stroking and classroom climate
6. Fixation at low level of questioning

Questioning often is used in a teacher centred group discussion because it allows the leader to initiate discussion, encourage participation, and keep the discussion on track. Avoid playing the game “Guess what I am thinking?” Use both open and closed ended questions. When asking a question, be clear whether you are directing it to the group or a specific individual. Welcome questions from other participants. The options include answering it yourself, redirecting it to the asker, or directing to the group or to a specific individual.

**Brainstorming**

Often used in group centred discussion because it helps a group explore and expand ideas. Idea generation that allows for suspension of judgement and evaluations so that individuals feel that they can voice ideas without criticism by other group members.
Usually followed by idea evaluation.
Creative problem solving consists of fact finding, idea finding, and solution finding.

Brainstorming

"Hitchhike" when appropriate (e.g. build on or extend a previous suggestion)

Four Basic Rules to Brainstorming

1. Criticism is ruled out
2. Freewheeling is welcomed
3. Quantity is wanted
4. Combination and improvement are sought

Evaluating each idea as it is generated turns off the thinking process.

Brainstorming is most effective when the problem is specific and lends itself to many solutions (e.g. differential diagnosis). Its effectiveness depends upon the reorienting the group to the ground rules.

Case Based Reasoning

A term used to describe a composite of techniques including
questioning and brainstorming which promotes self directed learning and application of factual knowledge. Has the potential to help learners assess their own strengths and weaknesses. As the name implies, provides the learner with the opportunity to discuss a particular case or topic. Need not be a clinical case e.g., ethics topic Although, case based reasoning may be employed in teacher centred and group centred discussions, it is especially well suited to learner centred discussions. In learner centred discussions, the group leader assumes the role of learner along with other group members. The “leader” while not providing specific knowledge, may lead the group by bringing the clinical reasoning process to a conscious level. Recall the techniques to “teach” problem solving skill from the last session

Managing Group Dynamics

One of the Most Important Behaviours to Exhibit is Simply Listening
Do not interrupt the student who is speaking, make comments or ask additional questions after he or she has finished.

There Are Two Types Of Situations You May Have to Deal With
The student who talks too much
Those who contribute too little

Encourage Student To Student Response
Be careful to avoid establishing a “wheel” communication pattern
Do not require participants to raise their hands if they wish to respond.
In fact, unless too many people ask at once, encourage participants to speak spontaneously rather than wait for you to recognize them.
If the participants are directing the questions solely to you, redirect the questions back to the group rephrasing them as necessary and let the students supply the answers, if possible.

Intervene When
A digression is taking too much time
Pauses between contributions are becoming too lengthy
Students are confusing values or inferences with facts
Logical fallacies are going undetected
Argument replaces discussion

Play Devil's Advocate
Another strategy favoured by some instructors is playing devil's advocate to elicit divergent positions or attitudes

Implicit dangers
To minimize this risk tell the group when you are assuming the devil's advocate role

Summarize Periodically
When you detected students are losing continuity or that they have exhausted the line of inquiry, briefly restate the major points that have been established.
Then provide a transition into your next eliciting question.
If the group is engaged in formal problem solving, you may need to ask them to reach consensus on each step in the process before moving on to the next step.

Provide Closure
Learning psychologists have observed that human beings have a strong need to see things put together to bring them to some identifiable conclusion satisfactory or not.
“Wrap up”
Summarize
Provide the participants with a sense of achievement

Climate
Help students develop a positive attitude towards controversy.
Be sensitive to the fact that choices are not always right or wrong. There are “different ways to skin a cat.”

Don’t Overburden Yourself
You needn’t be an “expert” to run a small group discussion
Use the learners as “resources”
You needn’t answer all the questions yourself or even have the final word
e.g., if attendings are part of the discussion group
don’t, however, let them take over and turn your session into a mini-lecture

Preparing A Small Group Discussion

Things to Keep in Mind
Physical setting.
Is it conducive to small group discussion
Number of individuals
"Homogeneity of group"
Are there many different levels of learners
Pre-existing level of knowledge or experience of participants
Your pre-existing level of knowledge or experience

Pick a Topic
One that lends itself to discussion
Not too straightforward
Group must have some prior knowledge

Set Objectives
“CAP” - Cognitive, Affective, or Psychomotor?
Don’t try to get too many points across

Determine the Best Session Characteristics for Your Needs
Teacher, Group, or Learner Centred
based on 6 characteristics:
1. The amount of leadership and direction required of the teacher
2. The amount of responsibility for the educational outcome to be assumed by the teacher
3. The degree to which the teacher is responsible for rewarding and reinforcing the learning that occurs
4. The level of knowledge of the particular subject required of the learner
5. The dominant style of interaction among the participants
6. The specific techniques of teaching used by the learner

**Determine What Mix Of Discussion Techniques to Use**

Questioning
Brainstorming
Case based reasoning

**Prepare Questions or Tasks**

**Familiarize Yourself With Managing Group Dynamics Before the Session**
APPENDIX D
SESSION HANDOUTS

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Student Evaluation of Resident Teaching Form ............... 443

Note:
All documents have been printed at 75% of original size to allow binding.
"12 Steps to Effective Feedback"

1. **Well-timed**: The closer to the performance the better

2. **Two way communication**: sharing of information
   - give the student an opportunity for **self evaluation**

3. **Ownership**: Begin with an I statement
   - based on **first hand** observation, not on hear say
   - subjective data should be labeled as such

4. **Descriptive** rather than evaluative
   - Describe, do not label

5. **Focused on behavior** rather than on the person or personality
   - **Focus on the behavior**, don't make assumptions regarding motives or intent
   - Behavior must be **changeable**

6. **Specific** rather than general

7. **Balanced**: Provide both positive and negative comments

8. **Rapport**: Based on trust, honesty, and concern
   - both on the same side
   - Common goals: Quality patient care / learning

9. **Stop and listen**: Resistance means non-receptiveness
   - **understood**: have the receiver try to rephrase the feedback

10. **Agreement of others**: when feedback is given in the presence of others, both giver and receiver have an opportunity to check with others in the group about the accuracy of the feedback

11. **Avoid overload**: It involves the amount of information the receiver can use rather than the amount he would like to give

12. **Be brief**: Say it once
TEACHING STYLES
1. Expert consultant
2. Socratic
3. Collaborative teaching

ADULT LEARNERS
• Want to use what they learn soon after they learn it
• Are interested in learning concepts and principles; they like to solve problems and not just learn facts. If they participate actively in the learning process, it is easier for them to apply the concepts and principles they are learning.
• Learning is best when adult learners can proceed at their own pace.
• Motivation increases when adult learners help to set learning objectives. Motivation is usually highest when the subject matter relates to the immediate interest and concerns of the adult learners.
• Adult learners like to know how well they are doing; feedback helps them to evaluate their own progress.
• Adults who seek to enhance their proficiencies see themselves as users, instead of recipients of education.

ROLE MODELING
• Role model does not always imply good
• You don’t have choice of being or not being a role model
• Be an intentional role model
• Powerful teaching tool
• Instruction of attitudes
• We cannot tell someone else how to be
• Setting tone, pace and expectation

LEARNING CLIMATE: FAVORABLE LEARNING ENVIRONMENT
• Enthusiastic teacher
• Time set aside for teaching
• Learners treated with respect, not intimidated
• Interaction by learners encouraged “supportive atmosphere”
• “Safe” to make mistakes
• Positive attitude to differences of opinion
• Teacher not seen as all knowing
• Teacher is a good role model

RESIDENT TEACHER EDUCATION PROGRAM

TASKS FOR THE WEEK
1. Reflect on the way you interact with the juniors
   • What is your main teaching style?
2. Watch your attending in actions
   • What is their main teaching style?
3. Watch for and report good and bad role modeling by yourself and others (i.e. attendings of other senior residents) - what impact do you think it had?
4. Watch for and report on the learning environment you provide to your students
### Helpful Clinical Teachers

1. Answers questions clearly
2. Enthusiastic
3. Explain the basis for their actions and decisions
4. Provides students with opportunities to practice both technical and problem solving skills
5. Summarizes major points
6. Gives feedback without belittling
7. Demonstrates a genuine interest in students
8. Strives to make difficult concepts easy to understand
9. Emphasizes conceptual comprehension rather than factual recall
10. Accessible to students
11. Provides competent patient care and role modeling
12. Approaches their teaching with dynamism and energy
13. Prepare well for rounds and other contact with students
14. Explains lucidly
15. Identify what they consider important
16. Discuss practical application of knowledge and skills

### Clinical Teaching Techniques for Residents

<table>
<thead>
<tr>
<th>Plan ahead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hold work rounds early</td>
</tr>
<tr>
<td>Make a work list</td>
</tr>
<tr>
<td>Group and divide the tasks for maximum efficiency</td>
</tr>
<tr>
<td>Meet with team at the end of the day to plan the next day</td>
</tr>
</tbody>
</table>

| Win cooperation by teaching |
| Tell students to ask for help when they need it |

| Communicate objectives and evaluation criteria |
| Use patients for teaching whenever possible |

| Think aloud |
| Build knowledge base |
| Associate ideas |
| Organize ideas |
| Encourage reading |
| Ask questions and explain |
| Rephrase or simplify questions |
| Address questions first to the student responsible for the patient |
| Wait for student to think |
| Consider the setting: patient present or not |
| Select an appropriate questioning style during case presentation |
| Use strategy of open-closed-open question to discuss cases |

| Set a Good Example (Role Modeling) |
| Motivate Learning |
| Appeal to current and future interests |
| Place a student in role of practicing physician |
| Remind student to prepare broadly, regardless of specialty interest |
| Remind student of course requirements |
| Arouse conflicting thoughts |
| Attribute success to efforts, and failure to lack of effort |
| Display high expectations |
| Emphasize each learner’s improvement rather than competition |

| Give Feedback |
| Evaluate Performance |
| Find out evaluation responsibilities |
| Write evaluation notes periodically |
| Advise attending physician of problem students |
| Fulfill due process requirements |
| Evaluate obtainment of the objectives |

| Problem Solving Strategies |
| Have students independently gather patient data and formulate the differential diagnosis |
| Pose hypothetical cases |
| Use a data repository for group problem solving |
| Study decision analysis |

| Teaching Procedural Skills |
| Explain the procedure |
| Demonstrate the procedure |
| Provide supervised practice |
TIPS FOR RUNNING EFFICIENT WORK ROUNDS

1. Clear objectives
   • Hold work rounds early
   • Make a work list
   • Group and divide the tasks for maximum efficiency
   • Meet with team at the end of the day to plan the next day

2. Plan ahead
   • Reserve five minutes of the beginning of the next day's work rounds for the answers
   • If the student has not done the work, reassign the task with a clear understanding that these tasks are important and that you will follow up

3. Pre-rounding by juniors
   • Clarify ahead of time how much time can be spent per patient
     • See sickest / most complicated first

4. Review with team how to do brief presentations

5. Encourage use of problem lists

6. Avoid lectures unless few patients
   • One to two brief teaching points per patient

7. In your supervisory role, you should flip through orders and charts for completeness periodically

8. Steps for Effective Delegation
   • Communication
     • Describe the framework of the assigned task
     • Describe the desired results
     • Ask for commitment
     • Agree to a timetable and an evaluation plan
   • Expectations
     • Expectations must match maturity and skill
   • If you delegate responsibility...
     • You must also delegate authority
   • Don't breathe down their necks
   • The person delegated to must be made accountable to the delegator
   • You're still on the line
     • While the students are accountable to you they are not accountable to the next higher level

RESIDENT TEACHER EDUCATION PROGRAM

TIPS FOR RUNNING EFFICIENT WORK ROUNDS

1. Clear objectives
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   • You're still on the line
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TASKS FOR THE WEEK

1. Before each workround, review the “One minute teaching skills”
2. Use 1. & 2. for every Student / Patient encounter (i.e., “Get a commitment” and “Probe for supportive evidence”)
3. Try to teach on short general point on most patients (i.e., 3.)
4. Use 4. & 5. where appropriate (i.e., “Reinforce what was right” and “Correct mistakes”)
5. Assign “Self directed learning” tasks
   • Use these relatively sparingly (i.e., no more than 1-2/day)
   • Give a time frame of when you expect the answer
ONE MINUTE TEACHING
SKILLS DURING WORK
ROUNDS

1. Get a commitment
   • after presenting the facts, the student stops to wait for your response or asks for your guidance
   response:
   • Ask the student to share what they think about the issue presented by the data
   • Issues may include coming up with more data, proposing a hypothesis or plan, developing a management plan, figuring out why the patient is noncompliant, deciding on whom to consult, etc.
   • "Get off the fence"
   rationale:
   • Asking students for their interpretation of the data assumes, respectfully, that they are processing as well as collecting data and are engaged as problem solving professionals
   • feel in charge - motivation

2. Probe for supportive evidence
   • when discussing the case, the student has committed themselves and looks for you to either confirm the opinion or suggest an alternative

3. Teach general rules
   • while discussing the case, you see an opportunity to provide a valuable teaching point
   • i.e., you know something about it that the student needs or wants to know
   • i.e., pearls and pitfalls
   response:
   • Provide general rules, concepts and considerations, and target them to the students' level of understanding
   rationale:
   • general rules are easier to remember
   • higher level of understanding for future application
   • go beyond the ward routine
   • students can often get by with simply learning the "ward routine" and not fully understanding the principles that underlay them
   • routines often change, principles are more long lasting

4. Tell them what they did right
   • you may or may not agree
   response:
   • before offering your opinion, ask the student for what evidence they feel supports their opinion
   • A corollary approach is to ask what other choices were considered and what evidence supported or refuted these alternatives
   rationale:
   • problem solving is dependent on knowledge base
   • get an understanding of the thought process
   • assess faulty reasoning
   • helps avoid, "the right answer for the wrong reason"

5. Correct mistakes
   • student has handled a situation in a very effective manner
   • they may not realize that the action was effective and had a positive impact
   response:
   • Take the first chance you find to comment on the specific good work and the effect it had
   rationale:
   • some good actions are pure luck while others are deliberate
   • reinforcement is important in firmly establishing skills / competencies
   • don’t confuse this with praise

6. Self directed learning
   • before offering your opinion, ask the student for what evidence they feel supports their opinion
   • A corollary approach is to ask what other choices were considered and what evidence supported or refuted these alternatives
   rationale:
   • problem solving is dependent on knowledge base
   • get an understanding of the thought process
   • assess faulty reasoning
   • helps avoid, "the right answer for the wrong reason"
OTHER TIPS FOR GIVING FEEDBACK

“Feedforward”
- let students know what is expected

Solicited feedback is best
- Feedback works best when it is solicited rather than imposed
- Take advantage of students' requests

Sensitivity to your values
- If an answer has no right or wrong answer, then be sensitive to your values, and do not impose them on the learner
- “My way to skin a cat”

“Ego sandwich”
- i.e., “Good / Bad / Good Sandwich”
- Avoid the bologna sandwich
  - Don’t sandwich negative feedback in between too many accolades or the person may not hear the reprimand

RESIDENT TEACHER EDUCATION PROGRAM

TASKS FOR THE WEEK

1. Sit down with your MSIs for a formal feedback session - use the “12 Steps”

2. Use informal feedback constantly - keep track of examples
   - feedforward
   - have the group provide feedback to each other
"12 Steps to Effective Feedback"

1. **Well timed:** The closer to the performance, the better.
2. **Two way communication:** Sharing of information, giving the student an opportunity for self-evaluation.
3. **Ownership:** Begin with an "I" statement focused on first-hand observation, not on hearsay. Subjective data should be labeled as such.
4. **Descriptive** rather than evaluative. Describe, do not label.
5. **Focused on behaviour:** Rather than on the person or personality. Focus on the behavior, don't make assumptions regarding motives or intent. Behavior must be changeable.
6. **Specific** rather than general.
7. **Balanced:** Provide both positive and negative comments.
9. **Stop and listen:** Resistance means non-receptiveness. Understood: Have the receiver try to rephrase the feedback.
10. **Agreement of others:** When feedback is given in the presence of others, both giver and receiver have an opportunity to check with others in the group about the accuracy of the feedback.
11. **Avoid overload:** It involves the amount of information the receiver can use rather than the amount he would like to give.
12. **Be brief:** Say it once.

**Managing Medical Mistakes**

The most fruitful lesson is the conquest of one's own error. Whoever refuses to admit error may be a great scholar but he is not a great learner. Whoever is ashamed of error will struggle against recognizing and admitting it, which means that he struggles against his greatest inward gain (Goethe, 1991).

**Step One:**
- Nonthreatening and nonjudgmental, so that open discussion of mistakes can occur.

**Step Two:**
- Ensure that supervision is adequate so that errors are detected.

**Step Three:**
- Determine the cause of the error.
- Every attempt should be made to separate the action (mistake) from the person.

**Step Four:**
- Determine a course of action for remediation.
  - For the patient.
  - For the student.
- Inconsequential mistakes can be used to demonstrate what needs to be done should a serious error occur.
- Student need to learn to recognize their limits, learn to ask for help and how to get it.

**Step Five:**
- Address the emotional needs of the learner.
- Conducive to emotional support.
- Help students deal with distress and guilt.
**Levels of Questioning**

**Mnemonic: “KAP”**

Knowledge: Remember  
Application: Understand  
Problem Solve: Analyze, synthesize, evaluate

"Fact" questions are of even lower level  
e.g., what was the Hb today?  
e.g., what was the urine output?  
This is by far the most common type of question asked by residents!!

---

**Resident Teacher Education Program**

**Tasks for the Week**

1. Learn the mnemonic KAP (Knowledge, Application, Problem Solving). Reflect while you are teaching: are you fixed at a low level of questioning? Try to move to higher levels.

2. Use the 5 types of probing questions rather than answering your own questions when a student doesn’t know or gets the wrong answer.  
   1. prompting  
   2. justification  
   3. clarification  
   4. extension  
   5. redirection

3. Review the list of non facilitating teaching behaviors. Catch yourself using them.
**QUESTIONING**

*Begin with assessment*
- become aware of the learner’s current knowledge, attitude and skills
- this also “activates” prior knowledge

*Eliciting questions*
- used to start a discussion
- if the response to the eliciting question is incorrect, use probing questions

*Probing questions:*
 1. prompting
 2. justification
 3. clarification
 4. extension
 5. redirection

1. **Prompting**
- Follow up Q(s) with hints or cues
- Instructor follows-up a student’s initially weak or incorrect answer with another question or series of questions containing hints or clues
- Can often trigger the student’s thinking
- Can also be used to encourage and support a student who is reluctant to answer because he is afraid

2. **Justification**
- “Why?” questions
- Asks the student to give the reason for his particular response or to explain why he chose to respond as they did
- This permits the instructor to determine the student’s perception and understanding of his own answer
- Allows one to assess a faulty reasoning strategy
- Often it is important for the student to have not only a correct response to a question but also to understand why that response is correct
- The right answer for the wrong reason”

3. **Clarification**
- rephrase / explain (i.e., no hints or clues)
- Useful when the student has given a poorly organized or incomplete (not incorrect) response
- No hints or clues are added
- You simply ask the student to rephrase or explain the response

4. **Extension**
- elaboration / detail
- Both clarification and extension questions are used to keep the students on the same train of thought, but to make certain points more explicit and complete
- Extension questions asks the student to elaborate on a correct response by providing additional information or more detailed explanation of the answer

5. **Redirection**
- involve another student
- Asking the same question of another student
- This increases student interaction
- This increases wait time and therefore indicates to students that they should not turn off their thinking because somebody else has answered the question

**NONFACILITATING TEACHING BEHAVIORS**

1. **Insufficient “wait time”**
- Instructor answers a preponderance of his own questions
- The teacher thinks for the students

2. **The rapid reward**
- Similar effect to insufficient wait time
- Rapid acceptance of a correct answer favors the fast thinker
- Those in midthought are terminated prematurely

3. **The programmed answer**
- I.e., answer is in the question
- Deprives the respondents of expressing their own thoughts
- Can be an effective tool when one desires to guide students’ thinking, suggest possibilities, or model logical thought processes

4. **Nonspecific feedback questions**
- “Are there any questions? Do you all understand?”
- What type of student will bravely call attention to their own ignorance when the question is posed in such a way?

5. **The teacher’s ego stroking and classroom climate**
- Students need to feel that it is psychologically “safe” to participate, to try out ideas, to be wrong as well as right

6. **Fixation at low level of questioning**
- Too often, however, questions become fixated at the informational level, requiring of students only that they recall bits and pieces of a rote memorized data
**Clinical Reasoning Process**

- can be divided into five behaviors

- It is recommended that you point out these behaviors in a learner centered discussion as they occur so as to bring these to a conscious level

1. Information perception and interpretation
2. Hypothesis generation
3. Enquiry strategies
4. Problem formulation
5. Diagnostic and or therapeutic decisions

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**Resident Teacher Education Program**

**Tasks for the Week**

1. Memorize the "Cognitive Learning Principles"

   1. Amount of prior knowledge
   2. Activation of prior knowledge
   3. Construction of semantic networks (propositions between two elements)
   4. Elaboration ("dwelling")
   5. Learning (and remembering) in context
   6. Motivation and time spent

   • take advantage of these in the way you approach your teaching

2. Use the following techniques for "teaching" problem solving

   A. "Why?" Questions
      • should be challenged by asking them to support, justify, and defend their answers

   B. "Model" problem solving skills
      • think out loud
      • explain your "why"
      • become consciously competent
Cognitive Learning Principles

**Principle One**
- The prior knowledge people have regarding a certain subject is the most important determinant of the nature and amount of new information that can be processed.
- Knowledge cannot actually be transferred but the pupil has to master it.
- The reason for this is that the already available cognitive structures that can be found in the pupil limits the extent in which he can understand new information.

**Principle Two**
- The availability of relevant prior knowledge is a necessary, yet not sufficient, condition for understanding and remembering new information. Prior knowledge also needs to be activated.
- Regular education does however know quite a lot of examples in which people do not seem to be able to relate new information to what they already know about certain subjects.

**Principle Three**
- Knowledge is structured in a certain way within memory. That structure makes it more or less accessible to be used.
- Knowledge consists of propositions that are structured in semantic networks. A proposition is an allegation that contains two concepts and their interrelation.

**Principle Four**
- Remembering information and recalling information from one's memory can be strongly improved when elaboration on material takes place in the learning phase.
- Researchers called this active way of dealing with learning material elaboration because the pupil "dwells" on the relation between two concepts.

**Principle Five**
- The ability to activate certain knowledge in the long term memory and to make it available for use depends on context.
- This process facilitates retrieval of that information later on, that is if that knowledge can be recalled within the same context!

**Principle Six**
- To be intrinsically or extrinsically motivated to learn, prolongs the amount of study time (or to put it in cognitive terms: the processing time) and subsequently improves achievement.
- Hence there is a linear relationship between the time spent on processing the subject matter and the achievement.

**Summary - 6 Cognitive Principles**:
1. Amount of prior knowledge
2. Activation of prior knowledge
3. Construction of semantic networks (propositions between two elements)
4. Elaboration ("dwelling")
5. Learning (and remembering) in context
6. Motivation and time spent

The Four Strategies of Clinical Diagnosis

1. **Exhaustive approach**
   - Most common method used by medical students
   - "My little pony" method

2. **Gestalt Method**
   - Pattern recognition
   - "Aunt Millie" approach

3. **Algorithm**

4. **Hypothetico-deductive method**

Effective Techniques for "Teaching" Problem Solving

1. **"Why?" questions**
   - Students should be challenged by asking them to support, justify, and defend their answers.

2. **"Model" problem solving skills**
   - Think out loud
   - Explain your "why"
   - Become consciously competent
**Teacher Characteristics**
- must give up some control
- process & outcome
- share the leadership
- open to learners' agenda
- open to learners' opinions and values

**Session Characteristics**
- A continuum
- teacher centered
- group centered
- learner centered

**Six characteristics**
1. The amount of leadership and direction required of the teacher
2. The amount of responsibility for the educational outcome to be assumed by the teacher
3. The degree to which the teacher is responsible for rewarding and reinforcing the learning that occurs
4. The level of knowledge of the particular subject required of the learner
5. The dominant style of interaction among the participants
6. The specific techniques of teaching used by the learner

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**Resident Teacher Education Program**

**Effective Instruction**
1. Begin a session of a short review of previous prerequisite learning
2. Follow with a short statement of goals for the session
3. Present new material in relatively short steps with learner practice after each step
4. Give clear and detailed explanations
5. Ask many questions and obtain responses from all learners
6. Guide learners during initial practice
7. Provide a high level of successful practice
8. Provide systematic feedback and constructive criticism to each learner
MANAGING GROUP DYNAMICS

• Listening
• Situations
  • The student who talks too much
  • Those who contribute too little
• Encourage student to student response
  • avoid "wheel" communication pattern
  • REDIRECT
• Intervene when
  • digression
  • Pauses too lengthy
  • confusing values or inferences with facts
  • Logical fallacies are going undetected
  • Argument replaces discussion
• Play Devil's Advocate
• Summarize periodically
• Provide closure
  • “Wrap up”
  • Summarize
  • Provide the participants with a sense of achievement
• Climate
  • positive attitude towards controversy
  • “different ways to skin a cat”
• Don’t overburden yourself
  • You needn’t be an “expert”
  • Use the learners as “resources”

DISCUSSION TECHNIQUES

• Questioning
  • see previous session handout

• Brainstorming
  Four basic rules to brainstorming
  1. Criticism is ruled out
  • suspension of judgment
  2. Freewheeling is welcomed
  3. Quantity is wanted
  4. Combination and improvement are sought
    • Evaluating turns off the thinking process

• Case Based Reasoning
  • composite of techniques
  • self directed learning & application of factual knowledge
  • need not be a clinical case
  • leader assumes the role of learner
  • bringing the clinical reasoning process to a conscious level

PREPARING A SMALL GROUP DISCUSSION

Things to keep in mind
• physical setting - is it conducive to small group discussion
• number of individuals
• “homogeneity of group” - are there many different levels of learners
• preexisting level of knowledge or experience of participants
• your preexisting level of knowledge or experience

Pick a topic
• one that lends itself to discussion
• not too straightforward
• group must have some prior knowledge

Set objectives
• ”CAP” - Cognitive, Affective, or Psychomotor?
• Don’t try to get too many points across

Session characteristics
• Determine the best session characteristics for your needs (see next page)

Choose discussion techniques
• Determine what mix of discussion techniques to use
  • Questioning
  • Brainstorming
  • Case based reasoning

Prepare questions or tasks

Group dynamics
• Familiarize yourself with managing group dynamics before the session (see this page)
EVALUATION OF CLINICAL TEACHING

Instructor's Name: __________________________

Instructions: Please read the criteria for each set of statements and rate each statement by filling in the appropriate bubble. Note also the write-in sections reserved for general comments on the back of the form.

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<th>Statement</th>
<th>Disagree Strongly</th>
<th>Disagree Somewhat</th>
<th>Equivocal</th>
<th>Agree Somewhat</th>
<th>Agree Strongly</th>
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<td></td>
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<tr>
<td>2. IS ENTHUSIASTIC AND STIMULATING (enjoys teaching and profession, is dynamic and energetic)</td>
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<td></td>
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<tr>
<td>3. ESTABLISHES RAPPORT (shows respect and personal interest in students, listens and is supportive)</td>
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<tr>
<td>4. ACTIVELY INVOLVES STUDENTS (stimulates thought, asks challenging questions, answers questions precisely)</td>
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<td>5. IS KNOWLEDGEABLE AND ANALYTICAL (in regard to breadth, analysis and synthesis of ideas)</td>
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<td>6. DEMONSTRATES CLINICAL SKILLS</td>
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</tr>
<tr>
<td>7. PROVIDES DIRECTION AND FEEDBACK ON WORK</td>
<td></td>
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<td>8. IS PROFESSIONAL IN MANNER (is self-assured, open to opinions of others, responsible and respectful)</td>
<td></td>
<td></td>
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<td>9. ADDRESSES THE DESIGNATED INSTRUCTIONAL OBJECTIVES OF THE COURSE</td>
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<td>10. IS OVERALL AN EFFECTIVE INSTRUCTOR</td>
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Please write your general comments in Write-in Areas 1, 2, and 3 on the back of this form.
APPENDIX E

ITEM STATISTICS - FINAL INSTRUMENT

SUBTEST 1  TEACHING EFFICACY SUBSCALE

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SUBTEST STATISTICS
NUMBER OF INDIVIDUALS = 20.00  NUMBER OF ITEMS = 6.00
MEAN = 23.65  HIGHEST SCORE = 27.00
STANDARD DEVIATION = 2.39  LOWEST SCORE = 17.00

HOYT ESTIMATE OF RELIABILITY = 0.61
STANDARD ERROR OF MEASUREMENT = 1.37
### SUBTEST 2  TEACHING SELF-EFFICACY SUBSCALE

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### SUBTEST STATISTICS

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- **MEAN** = 46.80  **HIGHEST SCORE** = 57.00
- **STANDARD DEVIATION** = 5.38  **LOWEST SCORE** = 33.00
HOYT ESTIMATE OF RELIABILITY = 0.88
STANDARD ERROR OF MEASUREMENT = 1.79

**SUBTEST 3 SELF REPORTED BEHAVIORS SCALE**

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**SUBTEST STATISTICS**

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- NUMBER OF ITEMS = 16.00
- MEAN = 58.85
- HIGHEST SCORE = 69.00
- STANDARD DEVIATION = 5.98
- LOWEST SCORE = 49.00
- HOYT ESTIMATE OF RELIABILITY = 0.81
- STANDARD ERROR OF MEASUREMENT = 2.55
APPENDIX F

SCORES: RAW DATA

Raw Scores: Control Pre-

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APPENDIX F

Raw Scores: Control Post-

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APPENDIX F

Raw Scores: Treatment Pre-

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## APPENDIX F

**Raw Scores: Treatment Post-**

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### APPENDIX F

Stats: Control

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APPENDIX F

Stats: Treatment

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TE = Teaching Efficacy
TSE = Teaching Self-Efficacy
SRB = Self-Reported Teaching Behaviours
Resident Teacher Training Program
-Consent-

Chief Investigator: Ric Arseneau, MD, FRCPC.................................682-2344
Faculty Advisor: Kip Anastasiou, PhD.............................................822-5316

The “Resident Teacher Training Program” consists of a series of weekly, one hour workshops on various aspects of clinical teaching (total 8 hours). This program is not only an educational activity for residents, but also a research project for the chief investigator. The sessions will be audiotape recorded for data analysis.

Participants will be required to complete a questionnaire at the beginning and at the end of the workshop. They may also be asked for their thoughts on various aspects of the program by way of a short interview at the end of the program.

The transcripts will be kept confidential, and no names will be included. After completion of the data gathering the tapes will be erased.

Although your participation would be greatly appreciated, you are under no obligations to participate and can withdraw at any time without any consequences.

Should you have any questions, feel free to discuss them with Dr. Arseneau (either in person or at the above number).

I consent to participate in the “Resident Teacher Training Program”*, and have received a copy of this consent form.

__________________________________________
Signature

__________________________________________
Date