

BEGINNING ACTION RESEARCH: ENHANCING AUTONOMOUS  
LEARNING IN A MEDICAL RADIOGRAPHY PROGRAM

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## ABSTRACT

As a clinical instructor in a medical radiography program, I began to wonder why some students reported feeling overwhelmed in the initial days of the practicum portion of the program. Having tried repeatedly to remedy the problem, I decided to take a closer look. I hoped in the process to gain some insights into what overwhelmed some students and not others and to understand the effects of being overwhelmed in the initial days of the practicum. This thesis outlines the action research approach used to study the practicum.

The principal participants in the practicum (the students, the radiology technologists, and myself, the clinical instructor) contributed to the generation of the data that formed our research, over the four-week practicum. The students and technologists participated in interviews, which were transcribed from audiotapes and distributed to the group for reading. When we read the typed material, we thought about our own similar experiences (or different experiences, if this was so). The problems that arose from the readings became our problems, and the students and I met to voice or express them as best we could. There were four meetings; from each meeting we chose an action plan. Each of us tried to implement the plan the following week. As we implemented the plan we also evaluated the outcomes we experienced.

I had a notion that the student, who was set on obtaining his or her learning objectives, would be an autonomous learner and would be less likely to be overwhelmed. So my intention during the practicum was to look for ways of enhancing autonomous learning. What I found was that the very process of action research enhanced autonomous learning in the students.

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## Chapter 1

### The Development of the Research Question

Many allied health-training programs recognize the value of the practicum (Bowen and Carline, 1997; Erstad, Armstrong, Callahan and Keller, 1997; Harris and Naylor, 1992; Polifroni, Packard, Shah and MacAvoy, 1995; Ryan, Toohey and Hughes, 1996). The medical radiography program at the British Columbia Institute of Technology (BCIT) is no exception. After four months of lectures and simulated practice, the radiography students, armed with a great deal of motivation and a logbook of very specific learning objectives, head out to the hospitals for their first practicum.

The students are excited and keen to show off their new skills in the "real world." Why is it then that some report an initial reaction of being overwhelmed? We've prepared them well at the college. They are highly motivated. They know their stuff! So, what is it that stops them in their tracks? For some students it's only a moment's hesitation, hardly even noticeable; for others it's disorientation, a system overload, an anxiety attack, or a feeling of helplessness.

These feelings are awful. Anxiety occupies the mind and consumes energy. Helplessness focuses attention inwardly, and closes the mind to the myriad of cues in the clinical environment that would otherwise stimulate learning. Disorientation drains concentration, which initiates mistakes and clumsiness that are generally uncharacteristic of the students.

I write knowledgeably about this because of the many times I have observed evidence of it and many times students have told me, their clinical instructor, of their feelings. So much so that I wonder, could it be normal for some students? I cannot say feeling overwhelmed is the rule rather than the exception because each student responds differently. It also makes me wonder what are the students' needs in the practicum? Why do they feel the practicum is so important? What do the students learn during the practicum that they cannot learn at the Institute? Why is the practicum



experience always different, always changing? When is it “good enough” and why is it important to strive for improvement? How can the practicum best serve the students' needs? How can it be done better?

### Coming to the Question

When some students, in the past reported to me feeling overwhelmed on their first days at the hospital, I was confident that I could remedy the problem. I tried various approaches to reduce their feelings of being overwhelmed. For example, at one point, I initiated individual interviews with each student during the practicum to discuss the student's confidence levels and strategies for success. Students were grateful for this help, but it did not address the issues of their first days at the hospital. In another instance, prior to their hospital visit, I supplied students with information about the hospital. For students who had no prior knowledge of the hospital, the details of this information were difficult to assimilate. Also, these students were studying for final examinations and so had no appetite for additional information. Another time I posted a group photograph of the students at the hospital, prior to the students' attendance there. Technologists could then recognize the new faces in the department when the students arrived and be ready to welcome the newcomers.

The students had suggested all these implemented changes, and yet the changes seemed to fall short of their target. When I reflect on the reason for this, I realize that changes made based on last year's student feedback may not be relevant to the new student. The new student has not had the same experiences as the students who suggested the change. Neither the student who originated the idea for the change, nor the new student is satisfied.

Change is at the heart of learning, regardless of philosophical perspective (Cranton, 1994) and change takes place when the student responds to the new environment. This kind of change the student can somewhat control. By choosing a response strategy and evaluating the results, a student

can adapt to the new environment. This is a self-initiated or autonomous action.

On the other hand, I control the changes, which I implement on their behalf as their clinical instructor. In making these changes for the students based on last year's feedback, do I exclude the new students from the process of responding to their own environment? Surely not, as each student must respond and adapt to any new environment, no matter how improved it may be.

Reflecting on these stories of my previous efforts to address identified problems, some of the origins of my beliefs about learning are revealed. McCutcheon and Jung (1990) say it is from stories such as these and our many other experiences that we form personal theories of practice or a "lived theory" (p. 144). My beliefs and assumptions make up the tangle that enmeshes my values. To be true to these values, I have to examine how closely my teaching and judgements measure up to my personal theories. However, first I have to untangle my values, assumptions, and beliefs in order to understand their origin and evaluate their significance.

One of my beliefs is that an x-ray technologist is a team player who must work independently and interdependently in a variety of assignments. The team player must be useful to the team. This implies that the competent technologist must have the flexibility to assume immediate responsibilities upon being allocated to any assignment and be able to use the environment to glean knowledge and insight rather than be overwhelmed by it. The technologist's task is to produce the best diagnostic image using the least amount of radiation with minimum discomfort to the patient. This technologist uses her or his resources to constantly cater to an ever-changing array of patients, conditions and technology. Utilizing personal resources builds confidence in the technologist's self-reliance. This self-reliance or autonomy is the very core or essence of the competent x-ray technologist. Autonomy makes the technologist a valued part of the team.

Our radiography training program recognizes this characteristic of the practitioner technologist and tries to develop these traits in the students by promoting autonomy or self-direction in learning.

During the practicum, students are expected to make their learning needs known to the staff technologists and to manage their time in the pursuit of their specified learning objectives. By taking control of initiating their own learning, students learn to rely on their own resources, and to value autonomy. Students who gain such experience are well on their way to becoming competent technologists. From these beliefs and the difficulty experienced in solving the recurrent student-identified problem of feeling overwhelmed in the practicum, my research question developed. It evolved into, "How can I improve my practice to promote student growth as an autonomous learner in the practicum?"

### Emerging Questions

The design of the clinical program assumes the student is an autonomous learner. This is evident in the fact that the student is expected to meet the learning objectives by doing radiographic examinations independently. In order to do these examinations, two conditions must be satisfied.

First, the student must be prepared. Completion of the course objectives prior to the practicum certainly prepares the student in the theory and practice of radiography. It does not teach the student every piece of radiographic equipment in the province or every protocol or procedure performed. The student who seeks to gain experience with unfamiliar equipment is more prepared when the patient arrives in the department. The student who reads the protocol and procedure manual has the advantage of knowing the procedure for the particular x-ray examination requested.

Students who neglect to initiate this review have difficulty when the patient arrives for an x-ray examination. When the student falters, the technologist is obligated to help the student. This leaves the student feeling that he or she was unable to meet the intended objective, resulting in loss of self-esteem and confidence.

The second condition to be met is that the student communicates her or his needs to the staff technologists. This communication helps ensure that the student and not the technologist performs the appropriate portion of the case. If the student wishes to meet an objective by doing a particular portion of an x-ray examination, for instance, preparing the room prior to the examination, the technologist must be informed. As the student keeps the technologist informed and up-to-date, cases that the student needs or wishes to do are more likely to be offered to the student by the technologist.

Both of these conditions require autonomy in learning. In other words, the students must initiate these actions on their own. The workload and time constraints make it unlikely and improbable that staff technologists will volunteer to teach the student how to use the equipment or to ask the students about their learning needs.

If students were entirely autonomous learners in the practicum environment, what might the scene look like? What might I expect to see? Students would seek answers to their questions and critique their surroundings rather than waiting to be told. They might try out new ideas and experiments rather than following each technologist's preferences. They would discuss procedures and practical difficulties with the technologists rather than accepting verbatim a technologist's methods. They would interact with the patient as a person, a fellow human being rather than an inanimate object. They would interact with the technologist or radiologist as a person, an equal rather than a demigod. The students would use the resources of the department and beyond to seek answers to their questions. They would be involved in the daily activity of the department. How can I promote these activities? How can I help the students become more autonomous to maximize the learning experience in the practicum?

## Viewing the Research Question through Different Lenses

To expand the research question I need to look at the question through a wider lens. The research question can be viewed from three different perspectives (McCutcheon and Jung, 1990). A positivist perspective assumes that life can be measured objectively. It assumes that behaviour is objective and testable and that the observer can capture the essence of the behaviour without any personal bias (Lincoln and Guba, as cited in McCutcheon and Jung). An interpretivist perspective assumes that people's life experience makes each person's understanding of reality unique. No one story can tell the whole meaning of an event for everyone (Bogden and Biklen, as cited in McCutcheon and Jung). A critical perspective assumes that through action and reflection, knowledge can, and should, be emancipatory (Carr and Kemmis, as cited in McCutcheon and Jung).

Habermas originated these three perspectives (Cranton, 1994). Habermas (as cited in Cranton) believes that a technical interest leads to factual or positive knowledge that can be tested and accurately reproduced. A practical interest in understanding others leads to interpretive knowledge in which we hold a more flexible view of events and ideas. An interest in equality and emancipation demands a critically reflective knowledge. By critically examining society's norms and our own beliefs we can endeavour to reach an understanding that reveals oppressive practices. Each perspective is appropriate in its own sphere, but when we try to apply a technical perspective and impose these more rigid ideas and rules on society, we are in danger of perceiving people as inanimate objects that fit into categories and rules. This situation leads to people and groups within society being subjected to oppressive practices or unnecessary hardships. As society accepts these oppressive practices, we tend to adopt them into our perspectives.

It is difficult to notice these perspectives, or lenses because of their embeddedness in our lives. These ways of thinking feel comfortable because we have used them for so long. But these

perspectives filter and colour our interpretive knowledge of others. Technical rules that we make are rigid and fixed and not all people fit into them. People are dynamic and ever-changing. Technical perspectives are, however, social constructs and, as such, are objects that we can remove or change. We can only change our knowledge or beliefs, however, if we examine them closely enough to see the flaws. We need to maintain a continuing critical reflection in order to see the way uncluttered by rigid and fixed beliefs. Each of these perspectives or ways of viewing the world results in seeing different things. In the hope of revealing deeper insights, I should look at my research question through each of these sets of assumptions.

My question from the technical perspective would be one that asks, "How can students be self-directed and autonomous in their learning?" It would seem to me that this would be the most effective method of learning. Autonomous learners would initiate their own learning. Driven by their own curiosity they would seek satisfaction through the many resources available to them in the practicum. If I could teach this curiosity as a subject in the curriculum, surely the problems would be solved. This "solution" reflects a cause and effect dimension evident in my previous attempts to "fix" the identified problems. To broaden this single focus, my question from the technical perspective is, "What can we (this includes the technologists, the students, and the instructor) do in the practicum to help students become autonomous in their learning and eventually in their radiography practice?"

Looking at it from the interpretivist perspective, the question might be, "How can we understand the diverse perspectives of the people who make up and define the practicum experience?" Here again, it is the students, the technologists and the instructor who define this experience. In these groups of people, different goals are evident. By seeing each other's point of view, we may gain understanding of our behaviour towards each other and its effects.

From the critical point of view I might ask, "Whose interests are served and whose are denied during the practicum?" Is it to the advantage of the staff technologist or instructor to allow the student

autonomy? Students can be perceived as technologists' or instructor's helpers. This makes our job easier but does not promote autonomous learning. Why is the student in a position of being "allowed" autonomy? Who gives this sanction? There is a power structure here that leaves the student at the lowest level. Is there a way to equalize this structure?

Zeichner (1993) believes it is not enough to simply improve practice, social reform should be the ultimate goal of education. Sutherland (1996) shows us that social reform can evolve from classroom reform if it is not stifled. Children in her class, alerted to gender discrimination, found that the Canadian national anthem excluded women. They wanted to write to their Member of Parliament. The teacher's first response was to refuse this request, but the trust and respect that she had built with her class held true and the research project moved to a higher level.

This serves to remind us that researchers must be aware of the road a research project can take and be willing to shoulder the responsibilities that it may garner. In trying to understand others we come to understand society. If I uncover assumptions and beliefs that I hold in my quest to understand the students and myself, I can, in their company, step forward toward change.

## Chapter 2

### Literature on Practica

An exploration of studies conducted on the practicum is indicated by my research question. If I hope to discover how I can improve my practice in the practicum, I need to clarify my understanding of the nature of the practicum. This review stems from a computer search of educational and medical indices and a manual search of several recent health care journals. I chose to search for journal articles because these are likely to be the most recent publications. I searched ERIC, CINAHL, Medline and Psych Abstracts indices. I found that the descriptors that I used were crucial. Initially I used "clinical experience" but found that "practicum" was the more common term in the literature. I also searched under "socialization" because I was interested in the initial experience of the student in the practicum. As articles came on-line, further descriptors became evident. These included adaptation, clinical competence, theory/practice, professional autonomy and experiential learning. On locating these articles in the library, I was able to search for citations that they listed. A citations CD-Rom is available in the university library for this purpose. Authors cited in a relevant article may be traced for other works. These works are likely to be related to the topic. Several journal articles were from health care journals. To enhance this aspect of the literature search, I manually searched the following journals over the current and the previous year: Nursing and Health Care, Journal of Advanced Nursing, Nurse Educator and the Journal of Education Administration. In my exploration of the literature, I came to a deeper understanding of the issues and concerns of educators in the field of practica.

Numerous studies have been conducted on practica across many disciplines. University and technical college co-operative programs place students in a practicum in the engineering industry for



various time blocks during their training period (Au Yeung et al., 1993). Larson (1996) reports on a practicum in a writing course. Teacher training programs place pre-service teachers in schools for practical experience (Carter, 1989; Peterat and Smith, 1996; Veale, 1989). Daresh (1990) describes an educational administration practicum.

In looking more closely at the studies, there are four main categories of research concerned with practica. Although some overlap occurs, these are the exploration of the various characteristics of practica, the examination of the student's experience of the practicum, literature reviews, and the evaluation of the success of the practicum in particular programs.

### Characteristics of the Practica

The characteristics of the practica described in the literature range from time factors regarding practica, to the value of knowing the objectives prior to the clinical placement, to the position and length of the practica in the program. Polifroni et al. (1995) found that increasing the length of time of the practicum does not improve the quality of education afforded by the practicum. Student nurses whose time was devoted to the independent and unsupervised provision of patient care during the practicum were not involved in an ideal learning situation. Working alone without supervision, these students had little opportunity to learn by observing the expert practice of qualified nurses. Useful feedback from practitioners about student performance was therefore limited. The researchers found that increasing the length of the practicum would do little to enhance the quality of the nursing environment in which the students were expected to learn.

Erstad et al. (1997) found that experiential programs early in the curriculum of a pharmacy training program were reported as valuable to students. In addition, they found that when two groups of pharmacy students were assessed, those with well-defined learning objectives reported a beneficial

practicum experience. The other group, without clearly defined learning objectives, was disappointed with the practicum. The researchers recommended that student learning objectives be explained during the didactic portion of the course before the practicum and again at the start of the practicum. They also recommended that the course instructor take steps to ensure that the minimum expectations for each clinical site are clearly communicated to site receptors and other practitioners or students assisting in the practicum process.

Au Leung et al. (1993) found that engineering students were disappointed in their level of achievement of learning objectives during the practicum. The staff members in the engineering industry tended to rate the achievement level of the students higher than the students rated themselves. The researchers also recognized from the survey that some students were concerned that the practicum was offered by industry as a means of obtaining labour for the industry's own requirements without payment of a salary. These engineering students were part of a cooperative education program, which offers a practicum as part of the education process. The researchers concluded by recommending higher levels of communication between industry and the teaching faculty. This would help all parties clarify the training objectives and the employers' needs. They also recommended a nine to twelve month practicum to reduce fragmentation and allow students to be placed in a more responsible position and take up more meaningful jobs.

### Student's Experience of the Practicum

After examining the experiences of medical students during a practicum, Bowen and Carline (1997) stressed the positive power of role modelling and social learning theory in the practicum. Nassimbeni (1992) supported this view with findings that showed students carefully avoid negative forms of role modelling demonstrated by practitioners. Behaviour which practitioners should be

encouraged to demonstrate through role modelling include respect for others, openness to criticism, compassion for patients, effective listening and teamwork. Bowen and Carline found that students measure success by seeing reactions and hearing statements that the practitioners make about the student's behaviour. In the milieu of the practicum, learning occurs when teacher-practitioners and students create shared meanings and common understandings. The researchers cautioned that this learning process may well be hampered by the demands of efficiency in the health care field which fosters short episodic contacts between teacher (practitioner) and student.

The Bowen and Carline (1997) study also showed that sharing partial understanding with other students enhanced learning. Small facilities such as clinics, which can accommodate only one student, abdicate the opportunity for collaborative learning with peers. Collaboration with other members of the practice was also important. To facilitate this, an orientation process into the clinical facility was recommended. The orientation process should succeed in granting the student admittance into the community of the practicum facility. Sound reasoning was more readily accomplished by the student when the other members considered the student an integral part of the department. If the student was perceived as a peripheral or illegitimate member of the practice, office staff or others in the practice built up bypasses to exclude the student from the normal process of communication. The student then had a more difficult task than necessary trying to understand the processes and workflow of the facility.

Bowen and Carline (1997) also recommended that the instructor interview each student new to the practicum to ascertain the learner's attitude, level of professional development and previous experience in order to mutually determine learning goals. At this time the instructor can assess the content and appropriate method of instruction for the student's learning needs. Getting to know the student in this way creates a collaborative teaching-learning relationship and

promotes teamwork.

### Literature Review of Practica

As a result of my literature search, I discovered a literature review on practica. This revealed many diverse sources and led to further insights on the topic. In reviewing this literature review in sufficient depth, a number of secondary sources are necessarily referenced.

The Assessment Centre for Vocational Education in Sydney, Australia funded Ryan et al. (1996) to study the purpose, value and structure of the practicum. To do so they conducted a thorough worldwide search of both educational and discipline-based databases. That relatively few studies of high quality were found by the search surprised the researchers. The literature search also demonstrated the immense diversity and extreme individual nature of practica. It was not surprising to the researchers that a high proportion of these studies concerned teacher education. From this field, the researchers chose a sample of overview works to represent the discipline of teacher education in their study.

Not only the nature of the practicum, but even the term used for the practicum varies with the discipline or the program: clinical practicum, field experience, clerkship, internship, sandwich program, apprenticeship and cooperative education are all common labels. Call it what we may, the fact that it is used by so many disciplines, in so many ways, emphasizes the value we place on the practicum. According to the researchers, (Ryan et al., 1996) finding evidence to support this value in the literature is an arduous task because few have studied practica across the disciplines. Ryan et al. state that the published literature, "rarely attempts to take a broad, cross-disciplinary view in order to compare the effectiveness of different models" (p. 355).

Another reason for the failure to find adequate support in the literature may be the

diverse conceptualizations of the practicum. Traditionally the practicum is regarded as a link between theory and practice. The practical component of a course helps the learner understand the theory of the course. The learning process is thus facilitated by practice.

A more radical concept proposes that the practicum itself is a learning method. The conflict the student encounters when faced with a novel experience in the practicum initiates learning. In the practicum problems arise which trigger a student's search for knowledge. Donald Schön (as cited in Ryan et al., 1996) argues in favour of this latter image of the practicum. While Ryan et al. reported that this view has not found much verbal support from teaching practitioners, they maintained that programs and courses in which professional practice drives the curriculum are influenced by Schön's work. Programs whose curricula are based on practitioner roles, competencies and abilities, and where case studies and clinical problems are used to stimulate and structure learning, use practice as a teaching method.

Schön's view is supported by research conducted by Baud, Keogh and Walker (as cited in Ryan et al., 1996). Questioning what "turns experience into learning and enables learners to gain the maximum benefit from the situations in which they find themselves" (as cited in Ryan et. al., p. 357) Baud et al. found that students learn through reflection on practice. They found that the opportunity to examine or reflect on experience in light of previous learning and current understanding is a crucial factor in learning. This research has prompted many programs to build requirements for reflection and critical analysis into the practicum. One study concluded, "the concept of reflection has come of age in nursing" (Marland and McSherry, 1997, p. 52).

The practicum in and across various disciplines has developed in different ways. Ryan et al. (1996) identify four types of practica. These are the apprenticeship, academic, growth or casework and articulated practicum. The apprenticeship model of practicum is primarily an experiential learning situation. The field supervisor is responsible for role modelling, observing

and guiding the student. The purpose of this type of practicum is student mastery and induction into the profession through on-the-job training. The academic aspect of this type of practicum is secondary.

The academic practicum places the theoretical components of the program in the foreground. The focus is on the cognitive development of the student and extensive academic preparation prior to induction into the profession. The purpose of this type of practicum is perceived as the acquisition of knowledge of the profession prior to practice. Medical programs use this method to adequately prepare students for clinical practice.

The growth or casework practicum focuses on the personal growth and development of the student. In this model, which may be unique to social work, the field supervisor carries the primary educative role. As students resolve personal life crises through personal growth, they are in a better position to assist clients to resolve their life crises.

The articulated practicum draws on student, industry and educational institution cooperation in contracting and planning the learning experiences. These three parties are partners in the success of the practicum. The purpose of this type of practicum is the induction of the student into the profession through the demonstration of professional competencies. This more recent type of practicum is utilized across a range of disciplines.

Regardless of practicum model the outcomes expected of the practicum are similar across disciplines. Daresh (1990) lists the opportunities for students that practica afford. Practica are expected to give students an opportunity to:

- apply knowledge and skills
- develop competencies progressively
- gain insight into the profession
- evaluate career choice

- assess personal progress and diagnose deficiencies.

These goals are not always achieved, but research (Au Yeung et al., 1993) does indicate that the practicum has, on the whole, a positive value in professional education. Au Yeung et al. list some successes of the practicum as:

- gaining insights to work and career prospects
- giving students access to job prospects
- developing job skills and performance
- developing social and interpersonal skills
- increasing contact between teachers and the industry.

Gibson (as cited in Ryan et al., 1996) adds:

- improving students attitudes towards supervision, self-confidence, practical reasoning and job skills.

Mann (as cited in Ryan et al.) contributes:

- integrating students into the work environment.

Pienaar (as cited in Ryan et al.) adds two more:

- developing student maturity and,
- enabling students to further contribute and participate in class.

Some of the failures of the practicum identified by Au Yeung et al. are:

- failure to integrate theory and practice
- poor, inconsistent supervision and lack of preparation of supervisory staff
- using students as cheap labour.

Turney (as cited in Ryan et al.) adds the following identified failures:

- difficulty in arranging appropriate learning experiences
- focusing on a narrow range of skills at the expense of a wider understanding of more systemic

issues

- a field experience which may countermand the educational program.

The single most important aspect of the practicum that emerges from the Ryan et al. (1996) literature review, is the need for a close and obvious link between the theoretical and practical components of the curriculum. This is especially true from the student's point of view. The literature strongly indicates a curriculum driven by professional practice. Ryan et al. list several programs that advocate core capabilities, which include critical and reflective thinking, problem solving and problem posing, effective teamwork, independent learning, effective oral and written communication and technical competence.<sup>1</sup> Ryan et al. found that the literature indicates that, generally speaking, the more clearly defined the learning objectives, the more the practicum is specifically designed and structured to meet these objectives and so the more successful the outcomes of the practicum. Conversely, the less well-defined the objectives of the practicum, the less prominent is the rationale for the structure of the practicum and for the placement decisions made for the practicum.

### Format of the Practicum

The placement of the practicum in the program and the length of that placement has also been studied. Ryan et al. (1996) report on the structure or format of the various types of practica in use. Au Yeung et al. (1993) found that the single extended placement usually occurs at the end of a training program. Carter (1989) found that multiple, shorter block placements are usually distributed throughout the program. Part-time placements of one to three days a week

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<sup>1</sup> These programs are the Bachelor of Business program at Auckland Institute of Technology in New Zealand, the Nursing Degree program at McMaster University in Canada, the School of Obstetrics and Gynecology at the University of New South Wales in Sydney, Australia and the Faculty of Nursing at the University of Western Sydney, Macarthur in Sydney, Australia.



concurrently with the academic courses and usually extend over a semester or year. Pienaar (as cited in Ryan et al.) could find little evidence to support one format over another. Custom and tradition seem to play a role in the decision making. Ryan et al. found in the literature that programs using placements extending between six months and one year failed to provide a valid rationale for the decision except that long term placements may allow a student to follow a project through various stages.

Ryan et al. (1996) cite a study of student teachers by Carter (1989) which provided some evidence that short blocks of teaching practice integrated with theory courses may be superior to a long protracted practicum. Student teachers returning to the practicum after further work at the college demonstrated increased confidence and utilized more sophisticated teaching methods. Another study by Dunn and Barnard (as cited by Ryan et al.) recommended short blocks of practice for nursing students. They believe that the practicum should be structured to integrate theory with clinical experience.

The opportunity to integrate theory and practice was the main argument given in support of the weekly concurrent practicum format. Having the students attend the practical setting a few days each week was a format chosen by one program studied by Pienaar (as cited in Ryan et al., 1996) because it was felt to be less disruptive to college life and student activity. Ultimately it may be the idiosyncratic traits of individual programs, which determine the choice of practicum format. As each program is unique, the format and sequence of the practicum in any particular program may well be decided on needs specific to the individual program. Since no strong evidence is available for one format over another, this practice need not be challenged.

## Future Research

The complex interfaces of each practicum pose difficulties for researchers. Most of the researchers used surveys that assessed student satisfaction. Price (as cited in Ryan et al., 1996) laments the shallow results obtained from research data obtained by survey method. Survey questionnaires tend to oversimplify the already complex issues of educational experiences made more complex by workplace supervisors, colleagues, differing organizational procedures, standards and expectations. The dynamic, multi-dimensional nature of the practicum with still yet-to-be-discovered variables is a daunting task for researchers.

Ryan et al. (1996) recommended three distinct issues requiring further research. These issues are supervision, learning outcomes and the format of the practicum. The role of supervision during the practicum is usually the most important factor in determining the quality of the practicum experience. Several organizational methods of supervision are utilized in practica. It is important to conduct research into the method that provides the best experience for the student.

The learning goals and outcomes best served by the practicum need to be identified. We need research into whether theory and practice are indeed linked in the practicum. Investigation regarding the effect of reflection and analysis of practice will aid in the success of future practica.

Finally Ryan et al. (1996) recommended inquiry into the length and format of the practicum. Finding sufficient practicum places for students is a perennial problem. Little is known, however, about the ideal length and configuration of the practicum that would enhance student learning.

## Success of the Practicum

Thomas, Janer and Beck (1996) evaluated the clinical experience of pharmacy students with the use of a questionnaire given to the students to survey their satisfaction with the practicum. The results indicated a need to assess and redesign the modules used to guide the students in the practicum. Recommendations were also generated regarding site placement. The study found that it was crucial to the success of the practicum to ensure that the site placement could provide the opportunity to meet the desired learning objectives. The study recommended increasing the credit value allocated to the course to promote the value of the course to the student. The researchers concluded that students should be paired up because of site and faculty constraints and to benefit the learning process. They found that learning is facilitated when communication and teamwork is promoted among learners.

Parish, Morton, Francisco and McCombs (1993) also used a survey to gather data to evaluate the practicum of pharmacy students. Their findings identified further courses they felt should be added to the curriculum. These included courses in effective listening, teaching methods, and management of interpersonal relationships.

To explore the practicum experiences of library and information science students, Nassimbeni (1992) also chose to conduct a survey. However, she backed this survey up with interviews that probed more deeply into the issues. The central question of her study regarded the socialization experienced by students new to the practicum site. She wanted to know whether students would be more likely to identify with practitioners and the profession having experienced a practicum?

What emerged from the study was the diverse nature of the practicum sites. Students encountered sites that ranged from unwelcoming to collegial. Students who met with negative experiences in the practicum found the negative effect to be more potent than the possible counter

effect of the more positive experiences. These students suffered a reality shock which is described by Olesen and Whittaker (as cited in Nassimbeni, 1992) as a “dysfunctional socialization effect which is the result of the discontinuity between the students’ preparation for professional practice and their actual encounter” (p. 59). Nassimbeni found that the practicum did have an influence on the socialization process. However, the differential factors that students brought with them to the practicum such as, motivation, skill, expectations, ability and affective disposition, made clear and unambiguous conclusions impossible. Even so, the strong effect of the negative experiences encountered by some students prompted the researcher to recommend that students be carefully briefed before the practicum. According to Schein, (as cited in Nassimbeni) discussions of diverse practices that the students may encounter in the practicum functions to counter the “possible negative socialization effects on students who have difficulty in handling dissonance of values between their formal teaching program and what they encounter in practice” (p. 60).

A study by Larson (1996) was also particularly interesting. She used case studies to examine a writing class assigned to a practicum. From an exploration of the literature and her observation of the class, she found that students experienced a process of transition when entering a new practicum or worksite. Their anticipation and expectations prior to the placement were met with reality on the first day, which jostled their motivation. Only on recovery were they able to settle down to work. She believed that preparing students to expect these events would enable them to cope more easily with the transition.

#### Revelation in the Literature

Here was research confirmation of my findings during previous practica. Was this an answer to the problem I had seen and heard about from the students in the radiography program? Their feelings of being overwhelmed initially in the practicum could perhaps be the difference between

anticipation and reality. Students come to the hospital with a plan or conception of how the practicum will be. When things are different from what the student expects, the student has to come up with a new plan or, in other words, negotiate with or adapt to the new environment. Now I understand why a good knowledge of the objectives of the course is so important for the students in the Erstad et al. (1997) study. Students going through this transition may well lose their way unless they are well focused on the task at hand, in other words, their learning objectives. A good belief in the value of these objectives may help keep the student on course. I can also see why studies concluded that students prior to going to the practicum should be well briefed and motivated to achieve their learning objectives (Nassimbeni, 1992; Thomas, et. al. 1996). Prior discussion of practices or settings that may seem alien or peculiar to inexperienced students prepares them in advance. This may help to fend off some of the shock that would otherwise leave them feeling disorientated and perhaps unable to attend to their own learning needs. The student who is strongly motivated to complete the learning objectives perhaps has more will and desire to formulate a new plan and adapt to the surroundings. This adaptation or negotiation with the situation or environment that is new to the student enables the student to keep on track and meet clinical objectives. Those less motivated or perhaps less prepared may take longer in this adaptation using valuable time, which delays the student's progress in the practicum.

Harris and Naylor (1992) studied physiotherapy students in the practicum. They were anxious to caution that the students in the practicum are adult learners and quoted J. Rogers (as cited in Harris and Naylor) to assert, "Adults learn best through participation and activity" (p. 127). Paraphrasing J. Rogers the researchers stated:

For experiential learning to occur, the learners should be actively and responsibly involved in the learning process. They should choose their own direction, and decide on the problems

involved and how to resolve them. Allowing the learners such freedom helps to make the situation meaningful and relevant to their previous experiences. If the learners are encouraged to value their previous experiences then their clinical placements develop into good learning environments (Harris and Naylor, 1992, p. 127).

While respecting a student's prior learning and expertise may promote learning, socialization into the workplace may not. Harris and Naylor (1992) found that socialization occurs where there is little supervision. The student is accepted into a tradition and is expected to acquire the groups' norms and values. Meanwhile the student's pursuit of clinical learning objectives is suspended. While there is bound to be an element of socialization within any practicum, Jarvis (as cited in Harris and Naylor) found that socialization is not, "directed towards the participant(s)' learning and understanding" (p. 127). Harris and Naylor concluded that socialization is not educational and to counter its negative effects recommended that the practicum be designed to specifically encourage an educational environment. This, they suggested, could be achieved by developing the relationship between the school of physiotherapy and the clinical educators. Should this endeavour fail, "learners may concentrate on the process of socialization rather than directing their own learning, developing critical reflection and therefore becoming autonomous learners" (Harris and Naylor, p. 129).

It is the student's process of becoming an autonomous learner, developing critical reflection and directing his or her own learning that interests me as an educator. Students who have the ability to readily adapt and change when faced with a new practicum environment have an advantage. Is this a skill or a disposition, can it be acquired or is it just a natural tendency in the student? In either case, how can the practicum better serve the diversity of needs of the students in the radiography program?

## Value of the Practicum

The practicum is a valuable learning environment. Lord (1997) states, “students make sense of what is presented to them by attempting to associate it with what they already know” (p. 198). The practicum gives the student the opportunity to utilize their recently acquired knowledge as they encounter each new experience in the practicum.

It is the social context of the practicum that *is* valuable in learning according to Lord (1997). He found that with teacher-centred styles of teaching, “there was no sign of interdependence within any of the groups, no colleague reinforcement, no colleague sharing, no colleague caring” (Lord, p. 215). Without the social interaction to be found in a learning environment such as the practicum, “students are less likely to develop interest in the subject matter, the discipline, or classmates other than their closest friends” (Lord, p. 215). This social interaction helps the student meet his or her learning objectives rather than dismiss the learning objectives in favour of adapting to the workplace culture. Students who must “fit in” to the workplace before being accepted as legitimate have a disadvantage. Personal learning objectives have to be set aside until a legitimate status has been earned. Only at this point can the student resume the original purpose of the practicum.

Higher-order learning such as critical thinking, reasoning and problem-solving is nurtured in the practicum. The diversity and novelty of experiences encountered in the practicum, “affords [the student] opportunities to seek rather than comply, to experiment rather than to accept, to evaluate rather than to accumulate, and to interpret rather than to adopt” (Hannafin and Land, 1997, p. 175). These opportunities reflect the richness that the practicum holds for the student who can readily overcome feelings of being overwhelmed and who can adapt to and utilize the practicum in order to learn. Hannafin and Land indicated that, in fact, the practicum might be the only environment in which the students can develop these higher-order skills. The researchers added that, “Many learners

cannot effectively engage higher-order tasks until they acquire sufficient background knowledge or skill” (p. 191). The practicum allows the background knowledge to be acted on and reflected upon and constantly refined. At this point understanding is reached and attention to higher-order learning may begin.

The diversity of the students' experiences in the practicum offers them multiple applications and adaptations. The variety of practice among technologists, the variety of patient conditions and disabilities, and the variety of equipment and procedures multiply this diversity. McCloskey (1996) believes that multiple points of view are an advantage to the student. Understanding more than one view allows students to see that their own view is only one view. Switching or “toggling” our perception between these views helps us gain a deeper and broader understanding. She stated, “it [holding more than one view] is necessary for wisdom. Pick one view, know what you're doing, and from time to time, for the hell of it, toggle” (p. 22).

To take advantage of this abundance of views we need, “a free, proactive, and influential adult learner who is able to engage in a learning process where the individual dually operates for self and beyond self” (Grace, 1996, p. 391). But how free is the student? McLean (1996) referred to Foucault when he described the three ways in which we are objectified within society.

First there are socially acquired characteristics and hence we objectify the “student.” No matter what a person does, he or she is primarily judged through the classification of “student.” Then there are the dividing practices and the student/technologist or the novice/expert dichotomy is created. This dichotomy serves to place boundaries and rules around actions. Certain actions are expected of one but not the other. Finally there are the human experiences by which we come to recognize and understand each other. For example, if a student were to faint in the operating room, we come to recognize this person not as a student but as the student who fainted. We are confined within this regime. “People’s daily thoughts and practices are trapped within, and support, systematically



oppressive patterns of social relations” (McLean, 1996, p. 12).

Foucault (as cited in McLean, 1996) believes that this subjection is a form of power relations through which the individual is defined and kept in line by society.

This form of power applies itself to immediate everyday life which categorizes the individual, marks him by his own individuality, attaches him to his own identity, imposes a law of truth on him which he must recognize and which others have to recognize in him. It is a form of power, which makes individuals subjects (p. 14).

This kind of power subjugates the individual and yet Foucault believes power need not be negative. “It incites, it induces, it seduces, it makes easier or more difficult; in the extreme it constrains or forbids absolutely” (as cited in McLean, 1996, p. 16). Constraints or barriers caused by extreme forms of power are obstacles to learning in the practicum. These barriers are, however, simply social constructs and as such can be changed or removed. Practical ways to transform unhelpful power relations must be sought if learning is to proceed.

One such way may be in the development of student self-determination. Field, Hoffman and Posch (1997) give three definitions of self-determination in their study. Deci and Ryan (as cited in Field et al.) say it is, “the capacity to choose and to have those choices be the determinants of one's actions” (p.286); Ward (as cited in Field et al.) defines it as, “the attitudes which lead people to define goals for themselves and the ability to take the initiative to achieve those goals” (p. 286) and Powers et al.(as cited in Field et al.) as, “personal attitudes and abilities that facilitate an individual's identification and pursuit of goals ... reflected in personal attitudes of empowerment, active participation in decision-making, and self-directed action to achieve personally valued goals” (p. 286). Self-esteem is a key issue in self-determination. Self-esteem affects how one acts. Feeling good

about yourself is directly related to accomplishing what you want to achieve (Field et al.).

According to Jarvis (1997) the power and authority some teachers exercise is a form of domination, which may veer toward violence and coercion. He says that, "teaching can, but need not, be symbolic violence and that, therefore, the autonomy and authenticity of the person need not be violated" (Jarvis, p. 83). To promote the freedom and support that fosters self-esteem and allows self-determination it is essential that the autonomy and the authenticity of the learner remain intact. Jarvis believes that as teachers we can help because, "Teaching ... is about being with others in the learning situation and being available to them. With this intention there can be no symbolic violence because the intention is to be concerned for the other in the teaching and learning situation, and this is the ethic of the professional" (p. 91).

But is this striving for autonomy for the sake of the learner or the sake of learning? How free are students to initiate autonomous learning? Perhaps the students are only, "free to choose within the confines of their shackles" (McCloskey, 1996). Jarvis (1990) states that, "it is not necessarily the democratic teacher who encourages either self-direction or negotiation - sometimes there is no opportunity given and the teacher determines that there will be self-direction and negotiation in an authoritarian manner" (p. 54). Autonomy in learning then becomes a teaching method dictated by the teacher.

However, in this case, it is the situation that dictates the method. The practicum demands a self-directed, autonomous approach to learning. The student must initiate completion of the learning objectives. This action on the part of the student enables the student to complete the objectives. Students without this autonomy or who fail to initiate this action are dependent on the busy technologist to enable the learning objectives to take place. This is not a dependable option; some technologists will not make this effort. Without the structure and foundation to support the student's autonomy, the practicum experience may fall short of its potential.

## Socialization into the Workplace

The literature persuades that socialization into the workplace, while it may be advantageous where practitioners display exemplary practices, in most cases is detrimental to learning. A preoccupation with being accepted by the indigenous workers deters the learner from the initial purpose of the practicum. Learning objectives are set aside while the student attends to the more basic need of acceptance. This brings to mind Maslow's hierarchy of human needs, where food, shelter, safety, love and acceptance by others and self demand attention before learning can progress in the process of self-actualization. The need for self-actualization or reaching full potential is the prime motivator of the individual (Maslow, 1954). Freeing the student from the toil of gaining acceptance by the indigenous practitioners frees the student from total dependence on the practitioner and helps to bypass the pattern of socialization. Learning objectives that can be met by actions initiated by the student allows learner autonomy. Understanding that it is her or his own action that leads to meeting learning objectives is the key to realizing this autonomy. No longer need the student seek the acceptance of the practitioner at the expense of his or her own learning objectives. The student has a purpose in the practicum independent of the practitioner. In the practicum, the student is legitimate in her or his own right. Thaler, Somekh, Draper and Doughty (1997) say it well, "Being named and given a responsibility enables individuals to adopt new roles and stimulate change" (p. 317).

In summary, the literature identifies several important issues regarding practica. A prominent issue is the preparation of the student for the practicum. Careful briefing and discussions of diverse practices that may occur in the practicum serves to prepare the student when such practices occur. This may help to counter possible negative socialization effects.

When students see practices that are unusual or strange, they may fail to value these practices and so become alienated from the profession. When the student is able to anticipate the uncommon or unusual, the student is able to reaffirm her or his own understanding and identify with the profession.

Along with this, the literature calls for collaboration between industry and education in program design. The more pertinent the students' learning objectives to the industry, the more support practitioners will give to enabling their achievement. Ongoing improved communication between educational and workplace facilities will enable the development of a curriculum that is driven by practice. Setting learning objectives valued by industry will foster a strong belief by the student of the value of these objectives and help the student to stay focused on the purpose of the practicum.

The practicum is a valuable learning environment. Learning may occur in the practicum that is impossible elsewhere. Many programs have incorporated opportunities for reflection during the practicum. Students able to reflect on their actions are more likely to apply theory to practice. Collaboration among students at the same practicum site helps students further understand their, perhaps partial, grasp of concepts and ideas of practice. Discussion of issues in a non-judgmental environment allows students to honestly explore their own understanding with peers. Acceptance into the practicum and an ability to claim autonomy and responsibility for learning encourages self-esteem and confidence. These factors are essential if learning is to be promoted.

The practicum is a complex assembly of many factors. The dynamic characteristics of these factors further complicate the situation. From the literature themes emerge which demand attention. By using the theory arising from research, we can endeavour to improve our practice in general and the practicum in particular.

### Chapter 3

#### Methodology and Research Design

Having arrived at a research question, and examined the context of the question, I focused my attention on the research methodology. Action research caught my eye and prompted further investigation. I endeavoured to understand the philosophy and utility of action research by reading the literature. I found that action research fit my own philosophy and purpose. The first section of this chapter explores the literature on action research, while the subsequent section shows how I used action research to investigate the practicum. I have described the research method and given a detailed description of the structure of the radiography program to help in understanding the method of research. I have described my own teaching philosophy and how the methodology, research method and philosophy mesh. At the end of the chapter, I have set the scene for the research project by anticipating students' expectations of the practicum.

Action research is many things to many people. While some action researchers focus on personal improvement, others emphasize the importance of social change. McCutcheon and Jung, (1990) argue that action research is most basically, "the inquiry teachers undertake to understand and improve their own practice" (p. 144). Zeichner (1993) agrees but maintains it should be "connected to the struggle for greater educational equity and social justice" (p. 201). He argues that teaching practice should be concerned with social justice and so action research, which investigates teaching practice, should also seek to promote social justice. On yet another tack, Chisholm (1992) sees no need for the initial inquiry to originate from the teacher. An action research project she undertook "was not a grassroots initiative and had not been devised directly by or with teachers in the first instance" (p. 251). A researcher rather than the teacher can investigate teaching practice. Ladwig (1991) disagrees with this point of view. He believes that action research in which researchers work with teachers in a minimally collaborative way is exploitative rather than emancipatory. Inquiry into

practice should be personally initiated and executed. Collaboration is also not the essence of action research according to Gauthier (1992). He believes that action research, "can take place anywhere - in one's office, in one's mind" (p. 193). Action research in the mind is truly remote from collaboration. And yet the collaborative aspect of action research is perhaps one of its strengths. But is action research only for teachers? To answer this question I looked for research studies in the health care field.

### Studies in the Health Care Field

Smith, Pyrch and Lizardi (1993) maintain that participatory action research actually promotes good health in the participant. Action research has a goal of personal and social transformation. It builds on the capacity of people to think and work together for a better life. It promotes the equitable sharing of knowledge, skills and resources to support fair social structures. All these things are ultimately health determinants. The researchers believe that awareness of the potential of this approach in health research and development is beginning to develop in the health care field generally. There is a dynamic relationship between people-centred development (or education) and participatory action research. Neither is complete without the other. Participatory action research moves communities to become more developed, more human, and helps them grow in confidence and enter new learning cycles.

Meyer (1993) used an action research project to help initiate a change in nursing practice in a nursing ward. This change would promote an increased involvement in care by the patient and family and friends. Meyer believes there is a trend towards reflection-in-action in nursing practice to help generate new or different professional knowledge that is more appropriate to practice. Action research can also be used as a means of making this knowledge more

appropriate to practice. Action research can be used as a means of making this knowledge public so that it can be shared with practitioners.

McGarvey (1993) promotes action research in nursing to solve the problem of the "research-practice gap" (p. 375). She maintains that the little research that has been conducted in nursing is not utilized in practice. This may be due to the inaccessibility of this knowledge to nurses and the esoteric nature of the research. Action research involves nurses in the research project and also specifically engages issues of practice. It is this characteristic of action research that "allows nurses to undertake research in the local setting" (p. 372). The researcher promotes action research as being a valuable asset to nursing practice.

Titchen (1997) used action research to hasten change from traditional to patient centred care in nursing practice. In her study she saw a change in how the participants developed and resolved practice issues. Initially staff felt they wanted to "get away," to go home, or to take time out when they encountered professional difficulties. Eventually, however, the staff was able to discuss issues non-confrontationally with each other. This was evident by conversations regarding professional problems during breaks times, conversations that had initially been restricted to social issues.

As I read more on action research, I realize that each author has a personal interpretation and commitment to action research. van Manen (1990) put it this way, "there is no agreed upon set of research techniques or procedures that many or most action research projects and models use" (p. 152). What is it about action research that makes people interpret it so personally?

## Practitioner's Personal Theory of Practice

McCutcheon and Jung (1990) talk about the practitioner's personal theory of practice. This is a theory each practitioner has developed from his or her actions and experience. Through the practice of teaching, perhaps through the learning of theories based on research, and from the assumptions and beliefs developed throughout life, these experiences contribute to the formation of the practitioner's perspectives. Through these perspectives we make sense of our world. These perspectives, however, are so embedded in our lives that they are invisible to us. To understand why we do what we do, we need to deconstruct our perspectives by seeking out the assumptions, beliefs and values on which the action is based. Seeking the perspectives of colleagues (in my case, students and technologists) is one way to question our assumptions. When we can make our values explicit, we can reflect on our actions for congruity with these values. We can begin to ask questions. What message am I giving through my action? Does this conflict with my values? What could I do to be true to my values? Are my values valid?

These questions may give some insight into the initial question of why action research is interpreted so personally. Each one of us has our own values. These values are valid for that person and each person is compelled to be true to her or his values. Consequently we each bring to action research values we hold dear. Action research accommodates these many personal values. It allows the researcher to examine his or her own values and in light of these values, to reflect on his or her own practice or actions. It makes researchers look for congruence between their values and their actions. Action research promises that we will, in the process of this reflection, examine the assumptions, beliefs and values we hold and in doing so we will change. We will not change into different people, but we will change in our understanding of ourselves.



## My Take on Action Research

Action research is a process whereby, as a researcher, I can inquire into my own practice. The process starts by observing my practice and gathering data that can be used to find evidence. What I am looking for is evidence that my actions concur with my beliefs.

Each of us holds beliefs on which we base our decisions, actions and thoughts. These beliefs grow from personal experience, assumptions that we make, and values that we hold. The origins of these beliefs are hard to detect; their strength, hard to assess. It is by these beliefs that we live.

If I can tease away the threads of my beliefs to unravel their origin, I can judge their worth. Beliefs judged unworthy may be identified and hopefully changed. If the belief is judged worthy, my actions now need to reflect this belief. When our actions do not reflect our beliefs we send false messages to others. Unfortunately this happens all too frequently. We act without thinking and in so doing, exploit or hurt others. Reflection on action will surely reveal conflict between belief and action. By combing the evidence gathered from my actions in practice and weighing it against my beliefs, I will formulate a plan. This plan will help me align my actions more closely with my beliefs. Having implemented the plan, I again gather evidence to reassess my practice. The cyclical nature of action research is continuous since practice incorporates all aspects of life.

Of course, I do not work in isolation. My teaching practice in radiography is dependent upon close interaction with the students and the radiography technologists. It is essential that they too are part of the process of gathering evidence and formulating plans. They too are action researchers. The cyclical nature of action research serves to build lifelong habits of reflection on and inquiry into practice.

Action research made doing research a possibility for me. Prior to learning that there was such a thing as action research, research seemed somewhat esoteric and unattainable. After all, the

language of research was dominated by words like phenomenology, ethnography, and grounded theory. Sure, I learned to pronounce them and even began to understand what these terms meant, but they did not strike the same chord as action research.

Actually, several chords were struck. In action research the research subject is included in the research project as an equal partner with the researcher. Influence over and input into data collection allows the research subject a certain control over the process. Both the research subject and the researcher are changed by the experience as we are changed by any experience no matter how minute. Previously, it had bothered me that researchers go into the field to study people, organizations, or communities, and then leave to write up the researcher's own opinions on events and meanings. I wondered what effect the research had *on* those studied? It seems to me that these researchers use other people to gain their own ends. I wonder what is given back, what advantages do those who are researched gain?

And what about the researcher? New knowledge has been created, new explanations given, but how does this affect the researcher? The researcher surely must be changed by the experience, yet as readers we are left to wonder, and can only imagine that, when the research project is complete, the researcher simply treks off to new, fertile research lands. The very essence of action research, however, is to inquire into our own practice; to reflect on our actions in light of our own beliefs; to examine how the actions we take reflect the values and truths we hold dear; to implement changes based on this reflection and to evaluate or inquire again into our own practice.

Action researchers are interested in action. What impact do our responsive actions have? Do others perceive our actions in the way we would wish? How do our actions reflect our true beliefs? Action research gives me the opportunity to scrutinise my motives, actions and their consequences while living the experience. At the same time, the students, as part of the research team, are able to reflect on their own practice, as are the participating technologists.

## Beliefs

The extravagance of taking time to examine the effects of my own labours is a luxury. Life is busy. Trying to fit as many things as possible into my daily schedule, I, perhaps like Scarlett O'Hara, say, "I'll think about that tomorrow." But that "tomorrow" never arrives, only another busy day. Here then is the great advantage of action research. It allows me to examine my teaching practice closely and to hopefully learn which actions support my beliefs and which conflict. But more than this, it affords me the chance to clarify my own beliefs and with this, the choice to affirm or change them.

Beliefs are those truths we each hold self-evident. Each of us has our own beliefs based on our individual experiences, cultural background and many other circumstances. Over time these beliefs become invisible. Scott (1998) writes, "we often are acting without making explicit the assumptions and beliefs embedded in our frameworks" (p. 98). Other times we may hold beliefs we are anxious to test. Students who believe they are poor learners, or unworthy of becoming technologists or who feel as if they are "imposters" or "not ready" for the practicum may act out these negative beliefs. Promoting a student's positive belief in her or his own learning abilities and improving a student's self-esteem and confidence aims at helping the student learn. Simply put, when our actions conflict with our beliefs, we feel we are betraying ourselves. The resolution of this conflict brings change. This may result in a change in our actions to align with our belief, or else a re-evaluation of our belief. Mezirow (1994) puts it this way:

We reflect on the unexamined assumptions of our beliefs when the beliefs are not working well for us, or when old ways of thinking are no longer functional. We are confronted with a disorienting dilemma, which serves as a trigger for reflection.

Reflection involves a critique of assumptions to determine whether the belief, often acquired through cultural assimilation in childhood, remains functional for us as adults. We do this by critically examining its origins, nature, and consequence (p. 223).

In action research we have a methodology that has the ability to help us reaffirm our beliefs or to help us change them. An action research project gives the participants the opportunity to reflect on his or her actions. The collaborative nature of action research enables my fellow researchers (the radiography students and the participating technologists) to reflect on their own actions and inquire into their own practice. This opportunity to align the congruence of their practice and beliefs will hopefully prove rewarding. When we discuss our thoughts, actions and outcomes, and share these with each other, we may learn, not only more about ourselves, but also more about each other. Without the experience of discussing our thoughts, actions and outcomes, we have one less opportunity to find out about each other and one less opportunity to examine and express our own thoughts. If each of us is simply a collection of our experiences and what we make of them, each new experience has an effect upon us. The magnitude of the effect is governed by the amount of similarity that past experiences have with the new experience. The more similarity, the more the new experience will be accepted and understood. An unfamiliar stimulus or event may be meaningless and so go unnoticed. In this way each situation is interpreted differently by each individual. As we work and interact with each other we negotiate and renegotiate our interpretation of events and come to a more common understanding of our world.

### Action Research Method

Sharing information with and learning from each other helps us value each other and ourselves. The students, technologists in the research project, and myself are adults of diverse

backgrounds and experience. Our expertise and opinions form the generated data. These ideas shape the subsequent data. We discuss our thoughts on how the practicum (as a “shared practice” among the students, technologists and myself) could be improved to enhance autonomous learning for the student. We decide on a plan and then implement it in the practicum. This way, the plan is elected, implemented and evaluated by the people who generate it, the students, participating technologists and myself. In choosing the plan we each are responsible to the best of our ability for its implementation and for assessing its impact.

I find in the process that I have at my disposal a new sense of agency. I imagine the others feel the same way. We are of one purpose in the development and implementation of a plan and as such the power of the emergent change is potent. Action research gives this power of change back to the very people who will implement it and on whom it impacts. The research question arose from recurrent reports that some students in the practicum of previous years felt overwhelmed initially. Overcoming these feelings of being overwhelmed allows the student to concentrate on learning rather than being overwhelmed. An autonomous learner takes action to pursue learning objectives. A student who can foster autonomous learning habits may be in a better position to readily adapt to the new learning environment of the practicum and attend to her or his own learning needs.

### Problems with Action Research

The research question is clearly my own. I have been anxious to solve this niggling problem for long enough. My past experience with students in the clinical practicum has highlighted this issue for me. It can surely mean nothing to the new student until he or she experiences the practicum and perhaps experiences being overwhelmed. If students feel overwhelmed at all, these feelings may be experienced by one student at a different time in the

practicum than another student. Practicing autonomy in an action research process in the practicum may or may not entirely dispel any feelings of being overwhelmed.

The technologists also had no real say in the initial question. My experience and perspective cause me to choose a question that I believe to be of value to technologists, students and myself. In promoting the question, I draw attention to it and give it value over other questions. The technologists and eventually the entire department reactively attend to the question and their actions and beliefs begin to reflect their acceptance of its value.

In this regard the action research project is flawed. In choosing the question, I influence the actors and ever so slightly alter the context of the practicum. This year the practicum will unfold differently because the research project is being carried out. The action research project is not a “fly-on-the-wall” approach to research. Its very nature influences and changes the stage setting upon which the practicum is played out.

And yet, I do not act in isolation. I too have been influenced. The students of past practica and technologists I have worked with have influenced my perception. Had some students not made me aware of their feelings of being overwhelmed in the practicum, had I not sensed the technologists’ interest in helping students learn, the research would have been very different. Only in the situation as I now understand it can I ask my research question “How can I improve my practice to promote student growth as an autonomous learner in the practicum?”

It would seem then, that the research question has not only stemmed from my experience but also from the context of the practicum environment. The question is posed. The acceptance of the question will reflect the relevance of the question to the students in the practicum and the technologists who work with the students in the practicum.

The research question is, however, simply a starting point. The situation under investigation (the practicum) will be defined by the variety of viewpoints expressed in the data

that is to be gathered. Winter (1989) believes that it is in the reflection and discussion of these viewpoints that we will begin to negotiate interpersonal meanings regarding the practicum. It is in interacting with each other that we conceive our reality.

Interaction with each other is an essential component of the action research project. Essential too is equality between the researcher and participants. I question with Meyer (1993), “to what extent is this possible in reality” (p. 1069). Treating students and technologists with individual respect and valuing each person’s contribution is a relatively easy step to achieve. The inherent and traditional role of the student to seek the reward of higher grades is perhaps less easy to suspend. In this endeavour, a student may report experiences that he or she believes are indicative of a grade A student. Similarly technologists participating in the research may hold personal reasons for recounting experiences aimed at some personal agenda.

To countermand these negative aspects of the project we can only rely on the number of people involved in the study. In this study I interviewed four students and four technologists. The authenticity of the narratives can be identified by the threads of similarity running through each person’s story.

It would also appear that no research project can be entirely invisible or without influence on the unfolding events, no matter what is studied. Awareness of this influence serves to enable vision of the research through the appropriate lens.

### Research Setting

Each province in Canada has at least one training program for medical radiography technologists. The BCIT radiography program stands alone in serving the staffing needs of the hospitals and clinics in British Columbia. Approximately thirty students a year are enrolled from

all over the province. The entire program of study takes twenty-five months to complete.

The students begin classes in January. For the next fourteen weeks classes and laboratory practise sessions focus on patient care, anatomy, radiographic positioning and evaluation, physics, imaging, communications and clinical orientation. At the end of this time, the students have studied and practised radiography of the upper and lower extremities, pelvis and spine, chest and abdomen. They have positioned their laboratory partner in the routine projections of all these body parts under the supervision of an instructor. Each student has also made a video recording of her or his performance of a randomly selected simulated x-ray examination.

On successful completion of the theory course objectives, the student is assigned to a practicum at a hospital in BC for four weeks in May. The practicum gives students the opportunity to apply their newly acquired knowledge and skills in novel, ever-changing, dynamic situations. The examinations that the students perform during the practicum are, for the most part, limited to those they have already practised at the Institute.

At the end of this practicum, the program breaks for three months and resumes in the September term. During the first six weeks of this term, the students take part in classes and laboratory sessions. The courses they take are a continuation of the previous term's courses, expanding on further physical principles, radiographic examinations and anatomical systems to include the urinary and gastrointestinal systems, shoulder and hip.

On completion of this session the class is divided and one half goes to a two-week practicum at the local hospitals. The other half stays at the institute for further classes. At the end of two weeks, the first half of the class returns to the institute to take classes and the other half goes out to the hospitals. This arrangement is repeated once again prior to the end of term and the Christmas break.

The practicum is assigned so that the student is not at the same hospital assigned in the one-month practicum in May. This is designed to give the student a wider and more varied experience.



The students complete specific learning objectives in these two-week practicum sessions. These objectives are based on the radiographic procedures that the student has learned in this, and the previous term.

In January the new intake of students starts. The returning students resume the two-week alternating arrangement between the hospital and the institute for the next fourteen weeks. At the institute their classes and practice sessions focus on the anatomy and radiography of the skull. At the hospital the students continue to complete their learning objectives. On successful completion of all course objectives, the student is promoted to a practicum year at the hospital. The student is assigned to a different hospital from the previous two practicum sessions, if possible. Here the student gains practice and experience until the following May. At this point the student sits the national examination in radiography and graduates from the program. A summary of the program format is given in Figure 1 on the next page.

For the practicum year and the first practicum month, twelve hospitals throughout the province are used. When the students are on the two-week alternating institute and practicum schedule, only six local hospitals are used. In the first practicum month, when all the students are at the hospital and none are at the institute the instructors from the institute go to the local hospitals to supervise the students. Here they work alongside the students completing x-ray examinations. The student is expected to be "patient ready" because he or she has completed the learning objectives for their theory and practice at the institute. The instructor's and the staff technologist's role is to ensure that the examinations performed are of high diagnostic quality and that the patient's well being is not compromised. The instructor and the technologist are required to conduct ongoing assessment of the students' abilities and adjust the amount of her or his involvement in the case accordingly. The student is expected to hone his or her skills until competent to complete the examinations without assistance. At this point the instructor is responsible for evaluating the clinical performance of each

student during specific x-ray examinations.

Timeline for Medical Radiography Program

YEAR	DATES	SITE	PROGRAM LEVEL
First Year	January–April	BCIT lectures and laboratory sessions	Level 1
	May	Practicum at hospital	Level 1
	June–September	Summer vacation	
	Sept.–October	BCIT Lectures/labs	Level 2
	October–December	Every two weeks	Level 2
	One half class	BCIT lectures/lab.	Level 2
	Other half class	Hospital practicum	Level 2
	Reverse students	Reverse sites	Level 2
	Repeat	Repeat	Level 2
Second Year	January–April	Every two weeks	Level 3
	One half class	BCIT lectures/labs	Level 3
	Other half class	Hospital practicum	Level 3
	Reverse students	Reverse sites	Level 3
	Repeat (one week)	Repeat (one week)	Level 3
	Repeat again (2 wks.)	Repeat again (2 wks.)	Level 3
	May–December	Hospital practicum	Level 4
Third Year	January–April	Hospital practicum	Level 5
	May	National Examination	Graduate

Figure 1

The ratio of students to instructors in the practicum is approximately four to one. When the instructor is working with one student, the other students work one to one with the technologists in completing x-ray examinations. The instructor ensures all students have an appropriate share of available instructor time and that he or she works in each area of the department in which the student is expected to gain competency.

At the hospitals, the radiography students are not in any competition for radiographic procedures or cases with other levels of radiography students. The graduating class has completed its final practicum year before the one-month session begins. The class that is to begin a final practicum year will not start at the hospital until close to the end of the one-month practicum. A problem does arise, however, because of the lack of instructors.

There are more affiliated sites than there are instructors at the institute. To solve this problem, some hospital-based clinical instructors take on responsibility for the one-month practicum students, prior to their year round task of supervising the final practicum year students. In this way the program is integrated between institute and hospital. The instructors at the institute are able to maintain their radiography skills and the hospital-based instructors are able to participate in yet another part of the radiography program.

The hospital instructors, accustomed to supervising final year students who are soon-to-be-graduates, have a major transition to make in working with the first year student. The standards of practice of a final year student and a first year student are widely different. Technologists at the hospital must also quickly readjust their expectations of the radiography students who are on the one-month practicum.

Certain standards are, however, expected of the first year students. The radiography program promotes autonomy in learning by expecting the student to be "patient ready" and to be able to complete portions of the radiographic examination independently, even on the first day of the practicum. For instance, a new student in a radiology department will start to do cases with a technologist or an instructor on the first day. The student is responsible for some part of the case. This may be identifying the patient and getting him or her ready for the examination, it may be the preparation of the room for the examination, or it may be attending to the radiation protection needs of the examination.

In completing parts of the case independently, the student is given credit for doing the case with assistance. As these component parts are practised, the student gains confidence. In time, the entire case can be completed independently and the student given credit for an unassisted case. In this way the student works through the program learning objectives, building experience with each completed case.

These learning objectives consist of several x-ray examinations that the student is required to complete. Some of these cases may be done with assistance; the student must complete others without any necessary help from the technologist or instructor. The student is directed to complete the assisted cases before unassisted cases can be entered in the logbook of clinical objectives.

Students are encouraged to use their time wisely. For example, when there are no patients in the department, the student should be completing objectives regarding equipment and procedure knowledge acquisition. In this way the student is kept busy and occupied productively throughout the clinical day.

As each objective is completed the student becomes more competent and ready for performance evaluation. At this point, the student is responsible for informing the instructor of his or her needs in this regard. On successful completion of four of these evaluations the student is recommended for promotion to the next term.

Students in the program are expected to direct their own learning. Organization of their clinical day is essential to maximize their activities and be available for patients who need the type of x-ray specified in the student's book of objectives. Skills must be polished and ready for use or else notes must be available for quick reference. The student who previews how to operate the equipment in the department is better prepared when the first patient arrives. The student who makes her or his case requirements known to the technologist or instructor prior to the examination is more likely to be given the appropriate level of assistance.

## Method of Research

The assignment of students to practicum sites was made according to student preference and accessibility, as much as possible. The program clinical coordinator finalized the assignment list. Any student changes thereafter had to be mutually agreed to by the affected students. Before the practicum, I met with the four students scheduled to come to the hospital to which I was assigned. I outlined the research project, and gave each student an opportunity to participate in the research project or to opt out. I explained that no consequences of either action would occur. The research was designed to investigate the first practicum experience of the radiography students. This practicum runs for four weeks in May. I devised a weekly cyclical format in order to gather data, interpret data, and generate a plan for change to be implemented the following week.

The data were generated in several different ways. To begin, the four students brought to the practicum a written outline of their expectations of the practicum. On the first morning they wrote about their hopes for the day and at the end of the day summarized their accomplishments and experiences. During the first week each student and I met for an interview which I audiotaped. I typed each of these pieces of data on a word processor to conceal student identification and promote confidentiality. The audiotaped interview was not transcribed verbatim. The originating student checked the intent and meaning of the typed data for accuracy. After this verification check, I entered it into the data pool.

This pool of papers was circulated to each student with a list of guided questions (listed in Appendix B) to consider when reading it. At the end of the first week, we met to formulate and agree on one plan, which we would implement the following week. A summary of this meeting was typed and added to the data pool.

The plan was implemented the following week and further data was collected. Again I

audiotaped an interview with each student. I recruited and interviewed staff technologists who wished to join the research project (in all, four technologists were eventually interviewed). As another staff technologist entered the research project, all the data generated up to this point was distributed to this technologist. At the end of the second week another plan was generated for implementation the following week. This cycle continued for four weeks. Unfortunately the staff technologists were not able to attend the planning meetings at the end of each week. Workload, shiftwork and part-time positions made this part of the research project impossible to arrange. For this reason, the students and I solely generated the action plan.

The student interview questions and worksheets are listed in Appendix A. Each interview had a dual function. The first was to build the student's self-esteem and confidence. This function is a part of the May practicum regardless of any research being conducted. A separate worksheet for each week was used for this purpose. The second aim was to gather data for scrutiny in the research project. The questions were similar in all interviews although the open-ended format of the questions led the discussion in diverse directions.

The worksheets were designed to meet the students' changing needs within the practicum. During week one, when the student may be feeling discouraged and overwhelmed by the task at hand, a poem illustrating some of the frustrations of learning is discussed. This poem, by Portia Nelson, is titled "Autobiography in Five Short Steps" (see Appendix A). The poem depicts the frustration of encountering the same problem again and again and making the same mistakes again and again. Eventually action is taken to avoid encountering the initial problem. In week two we talk about self-esteem and its importance at a time when we may feel less than adequate. Positive affirmation statements (see Appendix A) help to quell the many negative echoes in the students' minds as they are struggling to improve. In week three, the "Accessing your Strengths" (see Appendix A) worksheet enables the student to make a personal affirmative statement. By defining their own strengths, they

make them explicit and available for their own use. This worksheet helps to focus their beliefs and values and to strengthen and affirm their resolve. In week four the student is given the opportunity through the "Success Analysis Worksheet" (see Appendix A) to acknowledge his or her own successes and given practice in recognizing his or her own criteria for success. The format and content of these worksheet interviews are a standard part of the May practicum regardless of whether a research project is conducted. Only the students' responses to the research interview questions were taped and typed for entry into the data pool. The questions used for the student weekly interview are to be found in Appendix A.

The interview questions used in the technologist interview are included in Appendix B. Only one interview was conducted with each of the four participating technologists. When the data had been typed the draft was given to the appropriate technologist to check for interpretation accuracy. Having verified this, it was distributed to all the members participating in the research project. The data entries from the technologists were not labelled in any way to indicate a technologist was responsible for the content. The content itself, however, made this fact fairly obvious.

Some difficulties arose due to the shift rotation schedule of the individual technologists. When the draft was ready for proofreading, the technologist was not scheduled to work or was not able to get the proof back until several days later. For this reason the first data generated by a technologist only appeared in the data pool at the end of the second week. The other contributions from technologists began to appear in the third week and one was delayed until the fourth week.

The students found the technologist's contribution very valuable. There is no other way the student could gain the insights that were revealed in the technologists' interviews, short of interviewing the technologists personally. In these pieces of data the technologists gave their opinions about what qualities they consider important in a student and a technologist. The high regard the students hold for the technologists was apparent both in the responses from the students during our

interviews and in their interactions with the technologists. This high regard magnified the importance of the messages in the technologists' interviews.

I attempted to keep a journal during the research month in which to record my own opinions. I found, however, that the preparation of the data was an extremely time consuming enterprise. Forced to type the transcripts of the interviews in the evening and on the weekends, I found little time was left for gathering my own thoughts. My submissions to the data pool, therefore, amounted to three compositions spread over the first three weeks. My contributions were composed of a report of the first day of the practicum, an account of working with two students in the chest room, and a report of my interpretation of events that occurred, which led me to rethink my way of working with the students.

My voice was, however, well heard, I believe. I contributed to the data pool by submitting three contributions, I participated in the weekly planning meeting and helped to formulate the plan. Perhaps more than this would have tipped the balance. My position as instructor may, by its nature, carry more weight. I felt it was important that each of the three groups that define the practicum (students, technologists, and instructor) should have an equal voice.

### Autonomous Learner

The student who initiates actions designed to promote and enable learning is, in my opinion, an autonomous learner. Those who seize learning opportunities and take advantage of the resources within the environment in pursuit of their own learning agenda demonstrate autonomy. Learners can choose to follow course objectives and assignments and, above this, they can seek ways to further their own learning. Students who go above and beyond the course requirements are good students. They will utilize the myriad of resources that are available, especially in the clinical setting, to



complete the course requirements and then to satisfy their own eager curiosity. They are autonomous learners, driving their own learning, seeking answers to their seemingly endless questions. To be autonomous is to be self-reliant, to be in control of one's own actions, to be proactive rather than reactive. How can one become an autonomous learner? And what are its advantages? Why is autonomy in learning important to learners?

Candy (1987) reports that the assumption that there is a connection between the “conduct of education and the development and exercise of personal autonomy” is pervasive in the literature that he reviewed (p. 363). The difficulty in proving this link, however, reflects the lack of studies investigating the hypothesis. The process of learning is both an internal and an external process. Learners need to interact with their environment in order to learn, but there is also an internal process, which can only be executed by the individual. The teacher tries to rearrange the environment into one which is conducive to learning. It is however, only the learner who can finally learn to perform a skill or replicate information. Not only is the individual totally responsible for this stage of learning but can enable it. The learner who manipulates or manages the external environment to his or her advantage facilitates learning. The autonomous learner takes this advantage.

It would surely be impossible to learn without at least a fragment of autonomy because ultimately only the individual can choose to learn. The instructor cannot force the individual to learn. Even though there is no evidence of action, learning is a process that calls for agency, not passivity. Empowerment comes with the recognition of his or her own agency in the process of learning. By extending autonomy to more and more of the learning process, the individual is even more empowered.

Conducting research is also a learning process. Researchers seek new knowledge. The methodology of action research promotes autonomy in the individual because it demands the action of all the subjects participating in the research project. The action of examining practice and evaluating

performance and outcomes affords the opportunity to take further action to remedy identified problems. This is the quality that makes it possible for me to do research; it fits with my values and beliefs. The research subjects are no longer objects to be scrutinized and judged, they are partners in research and valued colleagues.

Through its collaborative nature, action research puts the frame of the research into a form whereby the concept of autonomy is upheld. Each of the three parties (students, technologists and myself) participating in the research project has input to and thereby influence and control over the generated research data and outcomes. We all guide and direct the progress of the research. Each of us contributes and each participates in the research. We are in this way autonomous. Our input is the meat of the research. Each one of us influences the outcome of the research. As the research question for the student, technologist and myself is, "How can I improve my practice to promote student growth as an autonomous learner in the practicum?" the methodology and the research question complement each other superbly.

### Autonomy in the Practicum

Students were prepared for the practicum. For four months they had attended lectures, completed laboratory practice sessions, studied, presented assignments, produced videos, and sat examinations. It was now time for the students to demonstrate their newly-learned skills at the hospital. The students were "patient ready."

Now they were expected at the hospital to improve their skills to become competent in certain procedures. Each student was equipped with a logbook in which to enter a record of certain specified x-ray examinations she or he had completed. The program faculty had carefully formulated the number and difficulty of these cases.

The students were given the tools of theory and the tasks of objectives, but was this enough? What of the transition from the institute to the hospital? Were the students prepared for this? Had this perhaps been overlooked? The students were told that they had to be self-directed at the hospital. How did we prepare them for this? Were these skills that the students should have developed elsewhere? How can we be sure the students have these skills? What happens to students who do not, who are not assertive and autonomous? Perhaps the practicum teaches the student to be autonomous.

If the student learns to become autonomous during the practicum, the practicum has served an additional purpose. Students who start the practicum ready to take an autonomous stance towards their learning, surely have an advantage. Those who never learn to be autonomous, even at the practicum, surely have a difficult time completing the objectives and reaching competency. To level this playing field, it seems evident that some students will need instruction and practice in autonomous learning, prior to the practicum.

### Preparing for the Research

This practicum would be the students' first clinical experience since starting their program of studies in radiography. I wondered what their first impressions would be. What did they expect of the clinical? Would the initial day be so full of promises yet to be fulfilled that they would hardly be able to wait to come back the next day; or so overwhelming that they would be unable to function?

Naturally, I favoured the first option. I wanted to show them the many opportunities for learning that were here at their fingertips. What I was afraid of was that they would somehow sense their own insignificance in the bustle and pomp of a busy hospital.

As previously stated, each student is an individual, a personality formed by her or his own experiences in life. Gender, cultural background, stress factors, self-doubts, previous work

experience, maturity and coping strategies are perhaps only a few of the influences that make each one unique. The way we do things, what matters to us, and, to an extent, what we think are influenced by our experiences.

In Canada a great many people watch television shows. If we experience television shows, we will be influenced accordingly. Each one of us, however, is influenced in a way that fits with that individual's past experience. For this reason each person may interpret the same show in many different ways. We pay attention to aspects of a show that have personal meaning for us and miss or dismiss those that do not.

To help me gain insights into the students' experiences and their expectations, I watched a popular hospital drama show that some of the students may, on occasion, watch. I obtained a video copy of a one-hour episode of "ER" and copied down my interpretation of events. I realize my interpretation will be in some ways very different from the students simply because of my thirty years experience working in hospitals.

At this point, I have no proof that any of the students in the practicum have ever seen this show. Even if they have, it is still only one thin aspect of the multiple experiences that goes towards the make up of a student's concept of hospital culture. Even so, it may be useful to weigh my experience against the popular fictitious portrayal of hospital life. If the show reflects the popular view, then it probably reflects a hint of each student's view, albeit a very small one.

The television show ER started with a glimpse of the home life of three of the emergency room doctors. The first doctor, Peter, is seen fussing over the expected arrival home of his newly born son. The baby is to be discharged from the premature ward. Peter had just brought in a boxful of resuscitation equipment. He reviews its use with the mother. She seems to have gone through this with him before. She assures him that everything will be all right and sends him back to work.

The second doctor, Dr. Ross, is seen strapping on rollerblades. He is an inexperienced blader.

His friend offers him a helmet. He refuses to wear it because she is not wearing one. She is worried he will crash. He says he will not.

The third doctor, Mark, is seen sleeping on the couch in front of the TV. Someone is knocking at the door. He recognizes his ex-wife through the peephole. He removes all the locks and chains from the door and lets her in. The room is dishevelled; she looks around and sees the mess. He picks up clothes to offer her a seat. He begins to clean dirty dinner plates off the table. The ex-wife complains he has kept their nine-year old daughter up late watching movies and fed her only pizza all weekend. The child was sleeping in class on Monday and complaining of a sore stomach. The ex-wife tells Mark that he cannot pick up his daughter on the weekends until he has his life back in order.

The scene shifts to the emergency department where the three doctors work. Dr. Ross is nursing a bruised head which he has injured rollerblading. Mark is there too and, when asked casually how he is, retorts that he is a "couch potato" who needs to get his life back in order. The staff gets the feeling he's cranky. Peter is seen taking a few minutes from work to see his baby and partner into a taxi. The prematurely born baby is being discharged from the hospital today. Peter's pager goes off and he has to leave. He looks torn.

The three doctors forget their personal troubles when a mass casualty alert is announced. A busload of school children is brought to the hospital to be treated for severe injuries after a crash. The scene is chaotic. The three doctors fully concentrate on responding to the emergency. From time to time, however, incidents remind them of their own problems. A pregnant woman delivers a stillborn baby and Peter is immediately reminded of his own newborn at home.

During the chaos of the emergency situation many mistakes are made in communications. Peoples' feelings are hurt. Most of the offences are worked out in the remaining minutes of the show. Each person is able to express his or her response to the situations and a status quo is maintained.

Various members of the staff are seen talking over the initial incident which prompted the offence. This action serves to resolve many of the hard feelings. Each one of the players in the scene is assertive and self-confident. Even the medical student is able to confront the teacher and, although the confrontation leads to physical violence, the end result is a better understanding between the two men.

We all form our expectations of reality based on our experiences. The reality of the practicum may be weighed against expectations founded on TV shows, on first hand experience of hospital visits and stays, visits to the family doctor, or on stories told by friends and families or read in books, newspapers or magazines. If these are our experiences, these are what we rely on to form our perceptions of reality.

TV, however, throws another dimension on the students' experience. TV watching requires little autonomy or participation. The viewer is subject to sound and images but the decisions and conclusions derived from these stimuli are given to the viewer. As viewers, we are required to keep an open mind and accept the given solution. We have no control, no interaction.

Should the student have this response in the practicum, the learning environment will be stymied. The purpose of the practicum experience is to practice recent learning in novel situations. Watching the "show" from an insiders position in a major hospital may be entertaining but of limited value to learning.

In the TV show everything works or at least works out in the end. In the practicum, students will see the difficulty of reality. They will see equipment that is less than optimal, behaviour they can neither justify nor change, and tasks that seem to be made inordinately difficult through lack of organization, information or proper equipment. In fact it may well seem like chaos to the student at first glance.

This "chaos" may precipitate feelings of being overwhelmed. As the first experience of a practicum for the student, it is bound to feel new or strange. By recognizing the normality of this

strangeness the student may be able to accept it and turn attention towards adapting to the new situation and pursuing learning objectives.

On the other hand, if the student expects the glossiness of a TV production and the convenience of timely solutions to personal and interpersonal problems, disappointments are likely. "Watching the show" unfold in a busy radiology department may be another way a student responds to the practicum. By watching, the student abdicates the opportunity to perform the case. The successful outcome of the case performed by the technologist serves to enhance the student's reverence of the technologist. The student's autonomy is depleted and dependence on the "expert" technologist is fostered.

## Chapter 4

### The Unfolding Practicum

This chapter gives a chronological account of the events of the practicum revealed in the gathered data. I have grouped the data according to the week in which it was generated in order to give a sense of the changing perspectives of the students, technologists and myself. The quotes from the data are detailed in an attempt to capture the context in which the quotes were made.

#### Reality of the First Day

On the first day of the practicum the students and I meet in the basement of one of the oldest buildings of the hospital. This is where the radiology classroom is located. This building has been condemned for demolition for over five years now. Financial constraints have denied access to the necessary funds to carry out this progress. Financial constraints have also halted renovations and anything more than minimum maintenance. The building is shoddy; the basement is worse. The students are not deterred.

But this is just one of the buildings of the hospital. The fiscal restraints have hit the whole hospital. A new tower was built prior to the restraints. New x-ray equipment was purchased, but when the restraints hit, there was no money to install the new equipment or to move into the new tower. The recently purchased equipment sits idle from lack of installation funds. The in-house engineers keep the old equipment it was meant to replace, operational with Band-Aid repairs. It is barely limping along. I could sense that the students were becoming more critically aware of the general malaise as we continued on our first day tour of the hospital.

“I thought the equipment would have been a bit newer, somehow,” one student remarked.

“Why can't a curtain be hung to cover some of these stored items?” Another asked. “It looks so disorganized.”



"Is that woman a technologist?" Exclaimed a third student in disbelief. The technologist was wearing tight "pedal-pusher" pants, a tee shirt that did not quite cover her midriff, and sneakers.

I was beginning to feel their disaffection with the hospital. In self-defence I walked the students through a part of the new tower. A few departments had managed to relocate there prior to the budget cuts. Here soft lighting, paintings on the wall, muted colours, and matching chairs met our gaze. Here there was professional looking staff. It would appear the surroundings had influenced the appearance of the people.

In an examination room of the nuclear medicine department things looked tidy and organized. Soft lilac-coloured drapes separated the room into compartments. When drawn back, one curtain revealed several shiny-new, stored items. I thought to myself that it would be a pleasure to work here. When we headed back towards the x-ray department, the question was raised, "When does our department move into the tower?"

Later on in the practicum one of the students, Kelly, said in the fourth interview, "Basically, I came to [the hospital] expecting stainless steel, bright lights, and sterile fields. What I found was old equipment and cluttered rooms." When I looked back at the initial data generated by Kelly on expectations of the practicum, no evidence of this kind of expectation was seen.

Kelly had the assumption that the hospital would perhaps be like a scene in the TV show. If a student has an assumption about the hospital and the assumption or expectation proves to be correct, the assumption becomes a given, something that is understood or that "goes without saying" and so is not worth mentioning or even acknowledging. When reality refutes the assumption, Kelly knows that the expectation was merely an assumption and is able to verbally express it.

Assumptions only become apparent or obvious when they are proven wrong. But, what of all the other student's assumptions that were proven right? They may never be acknowledged or verbally stated, but perhaps they serve to reinforce the student's self-worth by simply being proved right. At

the very least, fewer incorrect assumptions will help the student's self-confidence. In this case, an accurate and realistic image of the hospital may well serve to boost the confidence of the newcomer and help to quell the feelings of being overwhelmed that some students report.

### Feelings of Being Overwhelmed

Feelings of being overwhelmed start to rise when the students begin to realize that some of their assumptions are wrong. One such assumption may be exposed if students realize that unlike the Institute, the hospital is not primarily designed to facilitate their learning. Having spent the last four months at an institution designed to facilitate learning, students may expect a continuation of the same services at the hospital.

This assumption was not one that was apparent before the students arrived at the hospital, although evidence of its existence did arise throughout the practicum. It was evident in the way help was either an expectation or a surprise. "I want to be told things by the technologists - silence doesn't tell me anything" Fsai complains. Narif on the other hand is pleasantly surprised when a technologist inquires about the student's needs, "Its neat when the technologist asks you what objectives you have to meet today."

Expectations that all technologists will be willing to help and guide the student must invariably lead to disappointment and perhaps to feelings of low self-esteem. Fsai reflected this sensitivity, "In the afternoon, I was working with a different technologist and, although I communicated the same way with this technologist, I felt she did not like me."

When I followed up on this incident, I discovered that the technologist in question was just barely able to cope with severe personal problems. Relating this information back to Fsai did not seem to dispel the hurt caused by what was perceived to be the initial cold behaviour.

## My Practice

Teaching in the practicum demands many skills. Each of us has a personal theory or philosophy of teaching that we follow. In my role as clinical instructor, my teaching practice impacts strongly on the practicum and the way in which it unfolds. For this reason I need to define my teaching practice.

In the practicum, I teach radiography as if it were like learning to ride a bicycle. Watching someone else do it does not help learning, you have to do it yourself. By the time the radiography students go to the hospital for the practicum they know the steps of radiography as a would-be cyclist knows the mechanical motions necessary to propel a bicycle. What is needed is practice doing it.

As soon as the cyclist is able to respond to the feedback of balance, the cyclist has accomplished the goal of cycling. I think that this is similar to the feedback the radiography student receives from the resultant radiograph. An appreciative patient or an accurate and efficient performance in radiography are comparable to the wind in your face, or readily covering the terrain in cycling. These are the joys of radiography and cycling.

The value of the feedback from the resultant radiograph depreciates in relation to the amount of help the student is given during the x-ray examination. With little or no help, the student can take pride that the radiograph reflects her or his own efforts. The student can be critical of the film and take note to amend any identified imperfections when doing subsequent cases.

On the other hand, as more and more help is given to the student during the case, the resultant radiograph becomes the work of the helping technologist, in the student's mind. As a result, the feedback of the resultant radiograph is unconnected and irrelevant to the student. If the technologist helps the student to produce the radiograph, the radiograph reflects the technologist's expertise, not the

student's. The technologist's help in manoeuvring the patient or with accessory patient care needs, however, does not detract from the student's sense of owning the resultant radiograph. Receiving help with moving the patient onto the x-ray table or fetching a warm blanket for the patient does not compromise the student's radiography skills.

The skill on my part, as an instructor, is to know when an interruption in the student's radiography performance is needed to prevent an unnecessary retake of the radiograph. If the flaw is minor, it may be disruptive to the student's learning to correct it. A diagnostic radiograph is the goal and not necessarily a perfect textbook picture. The student's goal is to increase his or her skills to work towards perfection through practice and feedback. Although advice and feedback from the instructor or technologist is useful, the most potent feedback for the student comes from the radiograph that he or she has taken.

When intervention is needed, it is important to allow the student the opportunity to figure out the problem. This helps the student develop the habit of conducting a problem-solving overview prior to exposing the radiograph. The development of this skill will serve the student well throughout a career in radiography.

Teaching in this manner demands extreme patience. It would be easier and quicker by far to do the case myself. There are tremendous pressures on the student and myself to vacate the x-ray examination room as soon as possible because there are usually other patients waiting to be radiographed.

To provide an environment conducive to learning, the pressure must be taken off the student. Time is needed initially by the student to think carefully through the case. As the actions of a case become routine to the student, the focus can shift to increasing the speed of performance.

In a busy department, however, the luxury of time may not be available. To countermand the student's extended time with positioning the patient and preparing to take the radiograph, I find myself

taking on the tasks of a case that do not demand radiography skill-building decisions. These tasks may include processing the radiograph, completing the documentation, arranging for an escort to take the patient back to the ward, taking the radiographs to be reported, etc.

These accessory tasks are still part of the radiography case. It is important that the student knows each one. As the student and I complete an x-ray case, the student carries out one or another of these accessory tasks. With each successive case the student completes a different accessory task. This allows the student the opportunity to build up slowly an understanding of the sequence of events necessary to thoroughly complete an x-ray examination. As the student gains competence and speed in radiography skills more and more of these accessory tasks are taken on by the student until finally all are.

### The Technologist's Perspective on the Practicum

Four technologists volunteered to participate in the research project. Two were recent graduates of the radiography program and so knew it well. Of the other two, one trained in radiography in another province and the other in another country. All four had a strong interest and commitment to the radiography training program and in promoting student learning.

Inside the "label" of technologist there is an individual. This person is one who has needs and traits unique to him or herself. One of these needs that surfaced in the interview with each technologist is the need to be recognized as a person. A strong sense of the value of the individual above all else was evident.

Inez told me,

The skills you [the students] learn at the hospital will come but they are secondary to the

interactions that need to be made and built upon. That's the important thing. Even if the student feels intimidated by their surroundings, they need to overcome it and approach the tech [technologist].

Jo put it this way. "Interpersonal relationships and good communication are really important for the student. Technical skills are important, but not right away. Build relationships first."

Jamie describes the situation,

I think that what hinders student learning is their own attitude. Some students are a bit hesitant. That is just a personality trait and most of them get over that eventually. Some take longer than others, but that's all that is holding them back.

Most techs perceive this hesitancy as an indication that the student is not conscientious. They think the student is perhaps not interested. The student may want to see the "show" rather than do the cases. Students need to be more proactive and participate. When a student is in the x-ray room, rather than watching, they should offer to set techniques or ask to position. I have seen students just stand there throughout the whole case and that is definitely not appreciated by the techs. It puts the student in a bad light immediately and, especially in this place, it's hard to get beyond that. A student should be eager to learn, eager to work. Part of my job is to teach the students but if they don't seem interested, it's kind of hard.

Tourey offers a solution,

I think students would learn better if they are assigned to a tech all day rather than assigned to

a room. It is hard for the students to learn when they work with several technologists for one case, because the techs are assigned to another area. Techs are continually reassigned as the workload and patient flow varies so much. If the student was assigned to a tech, the student would be able to learn from the tech. more readily. The student could learn the ropes of the hospital from the tech. and the tech. could more accurately assess the student's performance.

The technologists have a need to get to know the students, but there is another need here, one that wants the student to be interested in and attentive to the individual technologist.

Inez gives a glimpse of this,

There are so many different techs at [the hospital] and such a variety of methods. When I was a student I had to remember the various ways each tech. preferred to work. One tech. had a way of doing shoulder x-rays that was different from everyone else. I made a point of remembering to do them that way when I worked with this tech.. The tech. was very impressed that I had been able to remember that particular way of doing shoulders.

Inez was obviously an exceptional student. This dedication cannot be expected of every student. Technologists recognize that, on occasion, they hold impossible expectations of the students. Tourey expresses this well by saying,

A good student is one who communicates well with the staff and the patient. One who has the patient's well being at heart. I think it is difficult for the techs. to gear back from thinking of students as Level Five [final year] students, because these were the last students we worked with. The Level Ones [first year] are naturally not at the same stage as the Level Fives who

have just graduated, and yet this is what we have become accustomed to when we work with a student. This is unreasonable of the techs. of course, but it is human nature.

But Inez got to the heart of the reason why teaching is rewarding for many technologists, in these words, "I really enjoy working with students because I think its quite rewarding to give your knowledge and find that the student responds to it and remembers it."

This response is perhaps the motivating factor in the working relationship between a technologist and a student. This may be the link that enables the technologist to "allow" the student to participate in the case.

Jamie showed me this decision-making in action,

I remember one case I did the other day with a Level One student. It was a knee x-ray on a patient from the ward. I decided I would let the student do everything. The student took the requisition and identified the patient and brought the patient into the room. The student was actually very attentive and very compassionate with the patient's condition, which was good to see. The student did the two views of the knee with the patient on the stretcher, which I also thought was appropriate. The student set the techniques, used the correct film and I pretty much just watched the student do it all.

It wasn't, however, the first case I had done with the student that day. The student had learned from the first case. The first case we did together. I demonstrated everything and explained what I was doing as I went along.

The technologist, in many instances, has the power to decide when the student can participate. One of the factors that helps the technologist make this decision is the student's response to the



technologist. Inez gives an example of how the technologist can be influenced in making this decision.

I'm really trying to make an effort to include the students. It is hard when the student is not assertive and they stand and wait for a technologist to rope them in. Not all techs. will do this. Whether the student is assertive or not, I try to get them into the [x-ray] room and give them things to do. One thing I have noticed in the past that concerns me is that if a tech. offers to do a case with the student, the student should not reply "I don't need it for my book right now." I've heard that so many times. I feel like saying "you're shooting yourself in the foot" because the tech. will not ask a second time. The techs even talk together about this. This shows that they consider it a big "no no." They think it shows that the student is only motivated by the logbook and is not really interested in radiography and in taking every opportunity to get more experience. Techs like to see eagerness and enthusiasm in a student. If the student is not interested in doing absolutely everything as a student, how will they be when they are a tech?

Interest and enthusiasm demonstrated by the student helps the technologist make a positive decision about allowing the student to participate. However, many other factors are at play. Tourey highlights one,

The students spend too much time positioning their patients. They check and double-check the centring. I try to stay back from the student so they have enough time and space to do a good job. I find that the students are nervous and need plenty of reassurance during positioning.

The variety of equipment and patients hinders student learning at [the hospital]. When

the technologist is stressed due to a heavy workload, the student feels it. They sense the pressure and it affects their performance. The tech can try to remove as much of the stress as possible from the student, but the student will probably still feel it. The students should not be placed in a busy area because of this. Students should practice positioning during slow periods in the department.

### Workload

Workload plays a greater part in the technologists' stress levels now that cutbacks in staffing are evident. The lack of staff in comparison to previous years was obvious on my initial return to the hospital. Perhaps the change in staffing levels was more noticeable because I had not been at the hospital for several months. Where I was used to seeing groups of technologists, I now saw empty hallways. On one occasion a patient, lying on a stretcher, asked me for help. I wondered what help this patient would have received had I not been touring the department as there was no technologist or anyone else around.

Technologists with heavy workloads may be reluctant to give time to the slow and timid student. Similarly those who have personal problems may be too preoccupied to attend to the students needs. And yet there are many technologists with hearts of gold. They want what is best for the student, even if it seems completely unrealistic.

Jo, for one, thinks,

Practice is most important. Unfortunately when the student is just starting out the case takes longer. Because of the time involved when the student is starting out it may mean that people are waiting. This is the worst thing in the whole department. The solution would be to give

the students their own x-ray room. If we had the money, this would be the ideal.

This idealism is reflected in the technologist's attitude towards the patient and towards each other. Their concern for the patient's right to information and respect is apparent, as is their respect for each other when working in a team relationship. Each technologist made mention of the technologist's responsibility in ensuring the patient's right to respect and information is honoured.

Jo put it,

A good tech. is one who has their own aims and objectives within the profession. One who knows that every patient is a hero and that every patient is different. One who is not just good technically but good to people/patients too. As they work longer in the profession, some techs may begin to treat it as a nine-to-five job. The tech. becomes very familiar with the x-ray procedures. But we must remember that for the patient it is or may be new. The explanation to the patient is so important but often it is missed by the tech. - perhaps because the tech. has heard it so many times before? The tech. must never forget why they are providing the explanation in the first place.

I read a journal article in which a patient described the treatment she received in a radiology department. It was an eye-opener. We have to remember that the patient is the consumer and we as health care professionals are providing a service.

The quality of that service includes many parts. Film quality is just one part. The patients' feelings and well being are also important parts. One of my patients wanted to see his film. I let him see it because it gave him satisfaction and it also helped me gain some job satisfaction. The patient is the most important person in the hospital; not the supervisor, not the doctor, not the manager. We are all service personnel giving service to the patient.

Jamie is adamant about this responsibility, "We should be telling the patient at all times what we are doing. We have to respect the patient's privacy and rights as well."

Tourey mentions it this way, "When the tech. is with a patient it's important to respect their dignity and condition. The patient needs to be informed of what is happening to them. They have to be given honest and accurate information."

Inez tells me,

Interpersonal skills are extremely important in a good technologist. A tech. needs to be friendly, needs to make the patient feel comfortable, feel as if they are a human being worthy of respect. Once a tech. has those qualities everything else comes from it and it shows in your work. Its important to know you have good radiography skills but the personality you present is of primary importance.

The attitude of the patient has a great effect when it comes to taking radiographs. The technologist must be ready to assess the patient's attitude so that they can deal with it sometimes even before any x-ray can be taken. I had a patient the other day from emergency.

He was very agitated. He didn't want to have the x-ray, didn't think it was necessary, had had it done before. I had to take the time to explain what we were doing, I let him know he could refuse the x-ray if he wished, why we were doing it, and how it would benefit him. I had to take that extra time with him and then it was fine. He had the x-ray, he was still grouchy but it turned out OK. I eventually got his co-operation.

The similarity of the technologists' viewpoints regarding their patients is heartening. This

group thought comes across again in their views about their own teamwork with each other.

### A Good Technologist

Inez gets excited talking about working with a good technologist.

When I work alongside a good tech we work as a team. There is no need to say "I'll do this and you do that" you just do it! It works so well. There are a few techs. that I really click with when we work together. We just race through the work and we never get confused. That is the best.

Jo says,

To me a good x-ray tech is one who is professional. When a case requires two techs it's important that the tech responsible for the case takes the lead. This tech should be able to direct others and co-ordinate the work. In an assisting position the other tech should be able to be guided by the lead tech and work together as a team. There are many ways of doing radiography. As a tech you should be able to take direction from another tech and do it as directed as long as it does not compromise patient care. If in your opinion it will compromise patient care you should offer an alternative way and inform the lead tech. Students also need to learn this professionalism.

Tourey thinks,

A good tech. is one who is patient. You have to be a good teamworker. You must have a good personality in order to get along with people. The technical skills are also important, but number one are the people skills. When I work with a good tech., they anticipate my moves. As I load up the cassette [film] into the tray, they set the technique [x-ray exposure] or get the patient or something. When I go to develop the film they QA [document] the case. Tasks are shared throughout the entire case and never duplicated, and yet everything gets done.

Jamie believes,

The people that I enjoy working with the most are the people who actually do things before you have to ask them to do it. They know what needs to be done and they just do it. If I'm positioning, they are setting techniques or vice versa. That of course comes with experience.

Individuals with their own needs, concerns and traits, the technologists surely are. At the same time, however, they hold common values and beliefs that pervade their thoughts and actions.

The technologists, students, and myself, the instructor, each have our personal agenda incorporating our personal needs, desires, and concerns. We also have a common agenda with our own group that links a student to another student or technologist to another technologist. At the same time, we hold yet another agenda, one that we all share together. This last agenda is helping students learn in the practicum. Each of us has an important function towards this end. We are codependent upon each other. How the technologist perceives her or his practice impacts on my practice. Without the technologist's support and commitment to the program, my practice would be very different. Understanding the technologists' concerns and issues helps me adjust and adapt my practice appropriately.

## Glimpses of a Student's Perceptions

The previous anecdotes and thoughts reflect a glimpse of my perception or interpretation of the practicum. Each student had his or her own perception. Some of these I caught glimpses of and some of them I seemed to instigate. One such incident was with student x (I will keep the pseudonym of this student confidential because the story may serve to identify the student). Student x was one of four students assigned to me at the hospital. The students were all in their mid-twenties. Some were male and some female. Not one of them hesitated to participate in the research project. Each one had a keen interest in radiography, a strong concern for the patient, and a desire to do his or her best in the practicum.

All examinations in the theory courses of the program had been completed prior to the practicum. Students who failed any subjects would be told prior to the practicum. A student still had the right to complete the practicum, but since the student had failed the program, there was little point. Students who made it to the practicum therefore felt safe that they had successfully passed the examinations.

Student x showed up for the first day of the practicum. The program head had told me that this student would be notified of having failed a subject prior to the start day. This did not happen. I was responsible for telling student x about the failure in one of the examinations.

The news was taken stoically. Student x chose to stay for the morning and to make an appointment with the program head at the Institute for later in the day. This student had tried for three consecutive years to get into the radiography program. The other students and I wished student x luck as we said our goodbyes at noon. Student x was back in two days having negotiated a package of remedial studies to be completed over the summer months.

I was impressed with the strength of character displayed by this student. The immense effort

and commitment given to getting even this far in the program would have reduced many students to tears at the news of failure. At the same time I wondered about the effect that this setback would have on the student's performance in the practicum. I need not have worried. The student was to be given two extra practicum days at the end of the month. As it turned out these were not used because student x had, by that time, completed all the necessary requirements of the practicum.

### Week One of the Practicum

The practicum eventually got underway after the upset with student x. I did my best to get the students taking x-rays on their first day and was thoroughly rewarded by their excitement and pleasure. At first, they gave me the impression that they think it is not possible for them to take an x-ray. I thought, "they are happy to watch and be given instruction. They doubt their own readiness." But when they started taking the x-rays, I could see their excitement. They said it was great fun and I thought so too.

Narif wrote,

The day went very well, it wasn't as scary as I thought it was going to be encountering my first patient. Once you get in there, it's a lot easier than you think it is going to be. You just need to take that plunge.

The hospital size is a little overwhelming, trying to find your way from point A to point B but that will just take time. I was actually surprised at the age of the equipment and the rooms, I somehow thought they would be a little newer. But definitely once we've worked here we'll be able to use any type of x-ray equipment, it's good to be versatile and adaptive to new situations. Plenty of new things to remember and everyone seems very nice and



accommodating to students.

“Taking that plunge” got Narif over the worrisome initial stage of the practicum.

Narif described the hospital size as “overwhelming” yet Narif appears relaxed and confident.

Although things are not as new as expected, Narif was ready to take on the task of learning. Narif was not disoriented, had a clear idea of what was expected and was ready to make a start on accomplishing the learning objectives. This was not the incapacitating overwhelmed feeling previously described to me by students.

Chi described the day,

NOT AS SCARY AS I THOUGHT! I felt more and more at ease with each case we did together as a group. Liked having everyone together (moral support) in the beginning. I noticed it is a much different experience positioning patients than each other in class. Women do not have bras on so you have to be very careful in touching and positioning (may accidentally touch them!) Patients seemed overall very co-operative and I got some feedback from one gentleman to speak up when behind the booth because it is so noisy out where they are standing. The atmosphere was very supportive and it made me feel really at ease.

Again the fear of the practicum is mentioned. Students do not know what to expect of the practicum and fear the worst. Finding the initial atmosphere supportive was a relief and allowed this student to overcome the fear that had been building with the approach of the practicum. Kelly wrote,

I had a very enjoyable time today during my first day at the hospital. The staff were all very

pleasant and treated us very nicely. I got to find out a little bit about the hospital policy and I got oriented with the different rooms and buildings related to the radiology department. The best part of the whole day was actually doing the chest x-rays and communicating with the patients. I learned the most from those few minutes with the patient and I learned a tremendous amount about the positioning skills and what is involved in communicating with the patients. I also got familiar with the patient chart and the computer data entry system. Doing an actual examination was actually much easier than I thought it would be.

You can almost hear a sigh of relief in this statement. The support and friendliness during the first day allayed fears that had grown with the ever-approaching spectre of the practicum. The social support is an important factor in placing the student at ease. More than this, the accomplishment of many of the students' hopes and expectations of the first day was instrumental in boosting self-esteem and confidence. I believe these accomplishments would not have been possible without the social support.

By midweek my interviews with the students were conducted and the first end of the week meeting was fast approaching. Each student and I had read the same data that had been generated by the students and myself. At this point the data consisted of reports of the students' expectations of the practicum, an account of their hopes for the first day and a summary of their experiences on the first day. There were also the transcriptions of the interviews with the students and a contribution from my journal.

The euphoria of the first day had faded and the students were beginning to feel some frustrations. Some of these were expressed in the first interview. What had started out on the first day as excitement and joy, seemed to have turned into criticism and dismay. Kelly told me,

There seems to be BCIT's way and [the hospital's] way and there seems to be no connection or similarity between them. The skills we learned at BCIT seem useless here. I feel I'm learning a new set of rules.

I felt shunned initially. I felt I was in the way. Some techs. [technologists] seemed unfriendly. Techs. have a busy schedule and I am just another problem or difficulty for them. I'm only now beginning to make some headway with the unfriendly techs.

I expected changes -- there were more than I expected. The pace is hectic but not as hectic as I expected. The equipment should be more modern. The department should be tidier and more organized.

What stands out for me is the level of patient care. The techs. are not as sympathetic towards the patient as I expected them to be. Have they become desensitized? The reason I want to do this job is to care for patients -- if you don't, what's the point? I wonder if I'll become desensitized to the patient and begin to treat the patient not as a person but as the next case to be completed and dismissed?

I feel I cannot contradict the tech. when they respond abruptly to the patient. I could, however, respond to the patient's concerns myself and try to assess their needs and try to accommodate them if I can. This will make me feel less of a victim in the situation and more of a proactive participant.

Feeling overwhelmed in this way, Kelly has had a setback. Frustration and resentment are rising and Kelly wonders if becoming an x-ray technologist will bring the unwanted change of becoming insensitive to patients. This is the overwhelmed feeling that students in the past have reported. Here the student is disorientated, anxious and focused on topics other than learning. Yet Kelly's enthusiasm is not entirely dampened.

I love this environment, I want more of the same, and I like being a health care worker for the respect. It's rewarding to be able to take care of a person and to be a valuable link in the diagnostic process. This is the first time I've done something that really matters to me.

Chi perhaps takes a more pragmatic stance. This student feels thwarted when the technologist "takes over" the case when the technologist's patience is exhausted. Chi realizes that although it feels bad, it is important not to dwell on this feeling and to move forward.

There can be many different ways each tech may proceed through the exam; different positioning methods, etc. I have found that I can get flustered when it gets busy and I am not familiar with the routine of the proper way things should be done. I was building up my confidence and then it got busy. The tech took over the case I was doing and it didn't feel good for my confidence level. I can understand this is a necessary part of a busy department and I want to just try to go with it and not let it affect my confidence. I think I can do this as long as patient care is not compromised. Patient care is important because that patient is a person who could be your mother or brother, or you!

Still the enthusiasm is there, along with the growing realization that action is required. Learning will not just happen, effort is required.

I love feeling the confidence grow - some things can throw you off but its important not to let it get you down and to try to keep a positive attitude towards learning. I feel I'll have to be really assertive when I go into "general" [the main department] although I don't like to be

overbearing. I think it's a good approach to say to your tech up front what you need for your book. I don't think it will be too hard to get the logbook [learning objectives] done.

Narif was settling down to the task. There is a realization that effort and ability to work through the situation is required.

Things that I am doing differently to help me learn are: writing down goals for the day and reviewing positioning for the next day. How have my expectations been met? Working with real patients is a great learning experience. It helps you problem solve about how to do different patients, not all patients are the same, its very important to assess them. I have only done chests so far but there are not too many variations: PA, lateral, AP, supine. Once you figure out which is best for the patient, it is pretty straightforward. I do not feel I will forget once I go to another room.

Patients are not difficult, some you just have to spend more time with. I have noticed some techs do not seem to do this, not give the patients the attention they deserve. I do not want to get like that. Many of the patients are very sick but they do their best to try and help you, it is amazing how well they cope, how strong they really are.

One tech was helpful in the morning in showing us how to do the room warm up, he just volunteered to show us, I thought this was very nice. I feel asking questions is very important, if I don't understand something I will ask someone and I am not afraid to do this.

Narif is able to critique the technologist's actions and decide whether or not to follow the role-modelled behaviour. Fsai told me of some difficulties.

I find the pace fast at the hospital. I thought it would be fast, but it's really fast here. Techs are different and have different ways of working with you. Some techs are easy to learn from. I don't feel good working with some techs. I don't take it personally. I'm not the only one who feels this way. I find I hold back my questions when I don't feel comfortable with a tech.

The apprehension about the practicum felt by some students comes out in Fsai's interview. The difference between the laboratory practice and the practicum is well defined.

My expectations coming into the practicum were to spend the first week finding out about the department. I was surprised to be doing cases right away. I think I was really nervous and apprehensive. I think I was lacking confidence because I did not do any patients from January to April.

In the labs at BCIT I had trouble articulating the instructions necessary for positioning. Here at the hospital it's different. It's not acting. The patients really have to know what to do, so I just tell them. The patients don't automatically go into position like my classmates did in lab. When I started doing x-rays here at the hospital I didn't feel uncomfortable, I just knew what to do.

When I was candystripping [volunteering in a hospital] I worked with geriatrics. It's not that stretcher patients or those who are in severe pain or illness have traumatized me, it's just that I don't want to hurt them any more than is necessary to get the radiograph. So if someone else has the expertise, perhaps they should do the case.

In the two days in the chest room, I learned there are similarities between ambulatory and stretcher patients. Some of our stretcher patients could actually stand for their films. It's good to get to learn to do stretcher chests because this lies ahead in Level Two [next term]. I

like the fact of getting in there and doing it but its good the tech is right there when needed.

Fsai identifies expectations of the four-week practicum that are perhaps unrealistic. Spending the first week solely in orientation to the department would severely eat into the time available in which to complete the cases specified in the logbook. By expecting the technologist to step in to do the sicker patients, Fsai foregoes the opportunity to improve skills and learning. The assumption that the technologist is available to do the more difficult patients closes a door on Fsai's learning opportunities.

### The First Planning Meeting

By the time the first planning meeting was held one technologist had been interviewed. This technologist was not able to attend the meeting because of workload commitments. Each of the students and I had her or his own experiences during the first week of the practicum and it is these, and our own interpretation of them, that we brought to the end of the week meeting.

I determined the format of this meeting. We would each give our opinion of what we felt was happening in the practicum, of what would help learning in the practicum, or of issues or problems that had emerged from reading about our own experiences in the research data. On a flip chart I recorded our voiced opinions. The group showed their agreement with the format of the meeting by their participation and cooperation. The statements and comments came quickly. I went around the table giving each one and myself an opportunity to have our statements recorded. Discussion ensued and time began to run out.

Prompted for a plan that would help them learn, Chi suggested "pre-setting techniques." More discussion arose and Chi made another suggestion, "communication with the technologist prior to doing the case." In the resultant discussion there seemed to be some agreement and so this was

adopted as the action plan for next week.

Communication with the technologist prior to doing the case is a requirement of the practicum. The directives in the student's book of learning objectives (logbook) requires students to tell the technologist what role the student wants to play in the performance of the case. Students can choose to assist, but still be responsible for completion of certain tasks or responsibilities. These may be attending to the radiation protection needs of the case, or preparing the room prior to the examination. The student, on the other hand, may wish to do the x-ray examination unassisted, in which case the technologist would switch to a supervisory role.

Although communication with the technologist prior to the case is a requirement expected of the student, few feel able to do this. Students new to a hospital are hesitant to tell the technologist anything. Students feel perhaps that the technologist knows better. They rely on the technologist to know what the student can handle. The technologist will eventually be able to accurately judge the student's capabilities, but initially needs time to assess the student. This assessment not only takes time, it uses up already scarce x-ray examinations. Students who tell the technologist prior to the case what they can do have an advantage. The action taken by the student alerts and reminds the technologist that the student is not simply a helper but someone who has specific learning objectives to meet. These students gain the ability to meet their objectives sooner. They also gain autonomy by taking action towards implementing their own learning.

I pointed out some of the implications of this first plan of action, especially in the fluoroscopy area, which I thought would be particularly difficult. The student would have to find out which technologist is responsible for which x-ray room, but still, because of the teamwork nature of the department, all technologists would need to be told of the students' requirements. The plan called for assertiveness on the part of the student. I knew the technologists would like the plan, because I had heard the technologists express their confusion about individual student's needs. Faced with a busy



workload, the efficient technologist needs the student to be efficient. The student who knows her or his requirements and communicates these to the technologist helps the technologist perform his or her duties more efficiently. I wondered how the students would know if this plan was indeed being followed. The students said that they would just know.

Time was up and we were off for the weekend. I, however, felt disappointed and frustrated. I felt that the "communication" plan was too general and too difficult to implement and monitor. But what did I expect to come out of the meeting? I expected a plan we could all agree to implement. Although I had agreed to implement this plan, I did not feel I could. The only way I could contribute to the implementation of this plan would be to encourage students to tell me up front their needs of each case. I felt that I already did this.

### My Plan

Perhaps this is why I made my own plan, a plan that I could implement myself. I had every intention of encouraging the students with the implementation of the student plan, and yet I wanted to do more. I planned to change the way I worked with the student. The plan, I hoped, would allow the student an opportunity to do the whole case and not just bits of it which then have to be pieced together like a jigsaw.

An episode that occurred in the chest room motivated me into making this plan. In the initial days of the practicum, I worked with two students together in the x-ray room. The objective was to get the students involved with taking x-rays as early in the practicum as possible. The two students were doing alternate cases. It was Fsai's turn.

The patient was on a stretcher and a tall gentleman in OR scrubs (operating room uniform) and surgical gloves was with the patient. When we brought the patient into the room we found out

that the tall gentleman was a respiratory technologist. He had to accompany the patient who required a high flow of oxygen. A large oxygen tank was supplying the patient with this need.

It was apparent from this equipment and the very sight of the patient that he was severely short of breath. I knew instinctively that this patient would weaken with the slightest effort; even sitting up without support would be an effort for this patient. This meant that absolutely everything had to be ready prior to moving the patient into position. With this in mind, I set to work with Fsai.

The respiratory technologist (Han) fussed around the oxygen and the patient and then, when he saw that we were taking care of the patient, started to talk to Kelly, the other student. As Fsai and I struggled to get a diagnostic image of the patient's chest, Han and Kelly stood back, watching and talking quietly to each other.

When the radiograph was developed Fsai and I hurried to place the patient in a more comfortable position, ready for transport back to his ward. Han and Kelly were now discussing the radiograph. Han had seemingly forgotten about fussing over the patient. Funny thing was, the patient seemed to have forgotten about his breathing difficulty too. The patient was also very interested in the radiograph and actually moved by himself into a better position to see it.

This made me wonder how much the attending staff influences the patient's behaviour. If the staff is calm, the patient may also be calm. If the staff fusses, the patient will become anxious. Although I pointed this out to the students, I wondered if they fully appreciated the value of the lesson.

When the patient had gone, I told Kelly that I was not impressed. To simply stand back and casually chat as Fsai and I did all the work was inappropriate. Kelly said that it was Fsai's case and the best thing to do was to not interfere. Kelly apologized sincerely.

Why did I react so strongly to this episode? It's because I believe that the practicum is a forum for the student to test his or her own skills, not the instructor's or technologist's. Although it is no problem for me to do the radiograph, I somehow resented the student judging my performance

from the cool calm perspective of the sidelines. How could the difficulties of the case be assessed from there? But perhaps Kelly did not know how to help with the case.

I believe that in order to learn from the case, the student has to experience it. I wanted the student to sweat, worry and struggle with this patient as I was doing. I wanted the student to feel the concerns I had. Will I be fast enough to get the radiograph done before the patient has to lie down again? Will I miss the bases of his lungs on the lateral radiograph? Did I expose the radiograph using the correct settings? Do I have the correct patient identification in the machine? In the midst of the case, all these things are going through my mind. Is this what happens to students as they readjust the machine for the twentieth time before feeling ready to take the exposure? Is this what's called "thinking on your feet?"

And yet Kelly's behaviour jarred at me. It paralleled my own behaviour as I step aside to "let" the student do a case. I stand back, watching, and I discuss points of interest in the case with the other observing student. Is this not the very behaviour I reacted strongly to when demonstrated by a student? From this vantage point, how can I know the struggles the student is experiencing? Only through having experienced it myself many times. But this standing back, how does this demonstrate teamwork?

Teamwork is not standing back. It is offering help, having useful resources to share, and contributing to the goals of the other at the expense of your own for the moment. An x-ray technologist is above all a team player. The reaction to help out should be spontaneous and technologists *are* spontaneous in giving their help. This is evident in the complaints from the students that the technologists are always doing bits of the case for them. Chi reported, "I find sometimes that I'll be getting to something and the technologist just gets there before me. Its kind of disappointing that they do it for you and I feel like saying, 'I knew that, I knew that.'"

I wonder then if my actions are giving a message that indicates a belief that I do not hold. I believe technologists are team players. I am a technologist, but I am also an instructor. As an instructor, I want the student to feel that he or she is responsible for completing the x-ray examination. To give the student the opportunity to complete the case unaided, I hold back my help until it is really needed. Similarly, technologists who “let” the student do the case must hold back the spontaneous reaction to help out. Not surprisingly, holding back is too difficult a task for some technologists.

On reflection of this incident, I formulated my own plan. I resolved to try doing the case along with the student, every step of the way. I would be involved in each decision and each task, but I would not make the decision or do the task alone. The student and I will work jointly, and rather than splitting the tasks we will execute them together. This will mean shadowing each other until the student has a good grasp of the entire routine of the case and needs more space.

My plan aims at solving two problems. Firstly, the student will be involved with the entire procedure of the case, rather than having to fit the pieces of several cases together to imagine the whole case. Secondly, I would be part of the team of the twosome doing the case and so be able to act in accordance with my own belief in teamwork.

## Week Two

The following week we implemented our plans. The students implemented the group plan, but just as I had devised a personal plan, I find that students also had additional plans to attend to. They too were experiencing learning cameos similar to the one I had experienced. They too drew their own conclusions and made decisions appropriate for themselves. Narif told me, “Having more confidence has definitely helped me meet my goals. Having the technologist have that faith in me has helped as well. This also helps another goal I have; to feel comfortable at what I am doing.”

The second weekly interviews were conducted and the resultant data circulated. This time the transcript of the first technologist's interview was circulated. At this stage, Narif was assessing progress and implementing coping strategies.

I find I have ups and downs in clinical. Today was really good -- a lot depends on how busy I have been. It really seems to affect the emotions. If you are not happy at the moment it does manifest itself in a way, but I'm not going to treat people differently because of it. Other people, technologists, patients, doctors, etc., also have their ups and downs when they are not able to meet their goals and priorities. You can't let it affect you.

I feel up and happy when I'm working with a tech that I enjoy working with. When I'm getting cases done. When I get so much done in a day. When I feel that a tech just doesn't want me around, then I'm just super-nice to them. It seems to work OK and it also makes me feel better. It's hard not to take it personally in a way. Asking questions usually loosens people like this up.

I didn't think it would affect me as emotionally as it has in clinical. In pre-orientation [a job-shadowing requirement prior to acceptance into the program], I wasn't up and down, but then I didn't have objectives to complete. It really matters in clinical because if the cases don't get done I won't be able to go on any further [in the program].

There is so much to learn - I want to know it all now, but I can't. I feel I'm juggling three things at once. At BCIT I thought nursing classes were quite useless, but now I find I'm actually using these skills at the hospital.

I'm learning more positioning skills on real patients. A chest I did this morning had one rib cage more posterior than the other. I didn't notice this until the lateral film showed gross rotation. When we did the repeat, I could see how to compensate for this, now that I

was aware of the problem. Until I build up this experience, I don't even know what to look out for. There are so many variations in the general population. The feedback from the radiograph really helps your positioning skills.

Kelly was sorting out problems and adjusting to the practicum. The importance of success in the practicum comes through in the interview.

I think its good to be at an optimum stress level. Last week I was too stressed, but this week its just right, its good stress. When I came into the practicum I did expect to get better, but I have a hard time imagining I'll be able to attain the expertise in the field that I see in technologists. I know eventually I'll get to be an expert, I know I'll get there, but I can't imagine what it'll be like.

Here is a student who has a good knowledge of the learning objectives and yet has still been initially overwhelmed by the practicum. The awe and fear that some student's have for the technologists is illustrated in Kelly's comments.

I still put techs. up there on a pedestal. Last week I was apprehensive of the techs. but now I find I can approach them. That was a big step. Techs. were people who were out of reach, but now they are more normal people, you can be friends with them. They are not these "celebrities" any more, now I realize they are real people. They all like their job, so that's OK. Every tech. is different, unique. I hope I get good at what I do so that I can do a good job. There is so much to learn. This is not a fear, just a concern.

Chi was discovering a preferred method of learning. The student's growing confidence had enabled the technologist to give the student more independent tasks. This in turn boosted the student's confidence.

I love it when I get to do something by myself. I have more of the confidence now where I just want to be kind of left to go and do it all. It depends who I'm working with and how busy it is whether I can. I want to be able to do it, but sometimes it's not possible because of the circumstances. I was hoping that by the end of the practicum I would feel more comfortable and confident doing cases. I feel I'm getting more towards that goal. Last week was like chaos. It depends on how busy it is, whether there is time to let me figure out a case. Sometimes I find when I'm working with a tech. and I'm concentrating on what I'm doing, I think I must ask a question that the tech. has just explained. I think this because of the response of the tech. when I ask the question. It's great when the tech. just explains it again. A tech. that explains things so that we can understand it is great to work with.

I feel more confident in getting the patient ready. Yesterday a tech. asked me to bring the patient in and call the tech. when I was ready. I was able to do this. I still forget some things sometimes but its starting to come together. It feels good to be relied upon like this and to be able to work independently. The experience to be let alone to do it and then when it's done to get feedback so I can learn from my mistakes -- this helps me learn. I learn a lot better if I can do it myself.

Chi was really into completing the learning objectives by this time. Adjusting the room schedule to hunt down the required cases was commendable.

I want to start getting my yellow pages done [a portion of the objectives in the logbook].

There is a spine clinic upstairs today. If its not busy or there are too many students in room 5, can I go over to the Emergency Department this afternoon? I would like to try to get syringe loading and some abdomens [examinations] done.

Fsai was trying to resolve some difficulties. Difficulties arose when different technologists had different professional practices or methods. Feeling rushed also hindered this student's learning.

I found lateral views of the knees done completely differently by two different technologists. One tech crosses the unaffected leg over the affected one, the way we are taught at BCIT, and the other one leaves that leg behind the affected leg. How do I deal with this? I feel I can't say anything to the tech. I just have to accept it and try to remember which tech wants what the next time I'm working with them. When I did the positioning, I felt I was positioned alright and I think it would have worked well. The tech changed everything. I wish I could just be allowed to see how my positioning would come out. I find that this conflict makes me go home at night and review my positioning notes and research the positioning books in order to check my own understanding.

I feel I need twenty seconds or so before doing a case so that I can gather my thoughts and mentally plan the case. I need to interpret the requisition [examination request form] - read the name, age, sex, etc. The techs will not give me this time and so when I ask for feedback during the case the tech just takes over and does the case.

I do try to talk my thoughts out loud so that the tech understands that I know what I am doing. I have a hard time reading the doctor's writing on the requisitions. The writing is bad and some of the words they use are unfamiliar to me.



But I am having fun. I can deal with these difficulties and I think I am gaining strength. I keep telling myself not to take it personally.

The data gathered from the technologist's interview also influenced the students' and my viewpoint of the practicum. Jo made the following observations:

I find the students refreshing. They have the basic knowledge from BCIT but no hospital experience. It's exciting and new to them at the hospital and every one of them is eager and willing to participate. I like it when they ask me if they can try to position the patient.

It's good when the student shows their initiative to ask to do things. Its better for them to do as much of the case as possible than to just observe. Sure they make mistakes at first but that's acceptable because people learn from their mistakes.

A good student doesn't just do it but tries to do it just right. It is one who shows care for the patient, who goes out of their way for the patient. It is one who takes the time and effort to do the whole case from the very beginning to the very end. One who hurries but never hurries the patient, even when others are waiting. The student who does one patient at a time and does it carefully, completely and consistently.

The tech. needs to give the student time to do the case. The tech. should stand aside, the student must get to do the case in order to learn. The tech. needs to observe carefully that the student is doing the right thing, has to give supervision and offer advice so the student can change and improve.

When the student sees their own film, the strengths and weaknesses of her or his own positioning are apparent to the student. It's good to let the student do it and see it without moving the positioning if possible. This way the student has the sense that they used their

own centring point that they palpated themselves. The student is then in a position to either accept their use of a correct centring point or adjust their centring on the next patient. If the tech. moves the centring point even by a centimetre, it is the tech's palpation method that is reinforced when the film is processed, not the student's.

### The Second Planning Meeting

Again it was the students and I who met for the second week end meeting. The technologists were either on different shifts, not scheduled to work or too busy with workload to attend. The meeting produced lots of ideas from the students and myself about what was happening in the practicum and what would help student learning. The day had been busier, especially in the afternoon. I was not sure if the students resented losing an hour of clinical time or if they were glad to get off their feet after five full clinical days. The ideas were slow to come to begin with, but once they started they kept on rolling.

This week the ideas that began to fill the flip chart very clearly indicated a plan to me. They all highlighted the need for the students to develop and stick to a routine of their own when doing cases. However there was a reserve from the students about stating or verbalizing this plan.

It crossed my mind that this plan was perhaps only obvious to me. Yet, when I asked the students what they thought the brainstorming session indicated, each one of them made mention of parts of their method of practice. For instance, one readily admitted forgetting important steps when doing a case. One complained that technologists would take over the case or do parts of it for them. One expressed frustration when she forgot what to do next during a case. One student protested feeling rushed during cases and not being given time to think.

To each student his or her own problem was unique. They were unable to see the

commonality of their problems. By firming up their own routine during a case, they would solve the identified problems themselves. Having a strong routine would prevent forgetting steps and stop the technologist from helping out because she thought the student had forgotten something. A strong routine would help the student know what comes next and make the performance more efficient and thereby feel less rushed.

The students finally settled on the plan of improving their flow or routine or of becoming more fluid or fluent in doing the cases. This was to be the plan for week three. We talked a little on how we would implement and evaluate this plan.

The students described how last week's plan, to increase communications with the technologist, had helped them. Each one of them felt she or he had increased communications with the technologist prior to the x-ray case. From the interviews I could glean clues about their progress. Narif talked about it this way,

I want to improve my communication with the patient and with the techs. I'd like to get a good portion of my book complete by the end of the week. Today I told a tech I wanted fingers and hands and that he could have the chests if he wanted. He was very agreeable. He even found a student when an extremity came along. I think that now the techs are beginning to get to know our needs because we are all communicating more. They are warming up to us. I think it has been a good plan to increase our communications with the techs because it helps us get what we want to get done.

Not only was Narif communicating with the technologist about needs prior to the case, but also about overall learning needs. This student was well aware of the learning objectives of the practicum and was letting these learning needs be known. Through a plan to communicate one aspect

of the students' needs, further communication of learning needs developed. Narif was demonstrating the attributes of an autonomous learner.

Kelly had also noticed a difference by following the plan. It seemed to feel right. Kelly had felt that the plan would work.

Its not been that bad this week as last week. There have been no surprises this week. Its been a big change from last week. I did that thing about being more assertive and communicating with the technologists. Every one of them accommodated me. I kind of knew inside that they would.

This week more than anything, I'm getting used to the hospital environment. I've got to know the techs better. Being assertive and communicating with the techs helped my confidence a lot. They didn't get mad, they accommodated me. It's not your fault if someone reacts badly to you because you are being assertive. If someone acts badly, that's what it is, acting badly.

Chi is implementing the plan to communicate with the technologists and is evaluating its impact.

I'll ask the tech if I can get some things done. It depends what cases come your way. And you just have to know what you need to get done. I'm telling my techs I need to get this signed and this signed. I explained to the techs that I needed lower extremities when the knee came in. Communication is totally important; they [the technologists] need to know what I need to do.

Chi has discovered the agency of autonomy. Letting the technologists know the appropriate learning needs enables Chi to complete the learning objectives. Fsai is also seeing improvement.

I feel a lot stronger now and more able to deal with some of the difficulties I have encountered. I don't think this was the case in the first week. I feel that my confidence has grown and that my interpersonal skills have been sharpened. I knew that not everything would go smoothly. Some people act differently under stress and they can't deal effectively with people and they may not be open to feedback.

I'm able to initiate things on my own now. I'm approaching techs myself now and getting my questions answered. It helps if I talk. I review my work in the evening and I try to plan for the next day. Now that I know what's done in each room I am better at setting goals that really will get done.

Fsai has made some headway towards autonomy in learning. Asking questions and talking more enables Fsai to learn. Planning for the next day helps efficiency. Familiarity with the clinical site allows the accomplishment of pre-set goals. This accomplishment leads to improved self-esteem and confidence. All the students had managed to express their needs and objectives to the technologists and their assertive front was paying off. Our plan had served to increase technologists' awareness of the students' needs and the students were getting better acquainted with the technologists. These factors helped the students to get the cases needed to meet their objectives. We discussed the need to keep implementing the first plan because of the ongoing need for good communications.

But something else was also happening. The students were becoming aware of their own power or agency. They were the ones who had chosen the plan designed to enhance their ability to

learn in the practicum. Now that they had implemented the plan, they were able to assess its impact. The positive response by the technologists served to highlight the strength or facility of setting goals and taking action. Here was a way for the individual student to change and adapt. The alternative is the frustration of wishing and hoping that individuals and circumstances will change to accommodate the student.

The group plan had indeed been a success. But what of my plan? I had decided to change the way I worked with the student. Rather than sharing tasks, the student and I would shadow each other throughout the whole case. The intent was to ensure the student participated in the entire case to prevent the student from missing crucial events. These missed events then become questions or curiosities that serve to distract the student from the task at hand.

The implementation of this plan was not entirely successful. By the second week (which was when the plan was implemented) the students had already pieced together the components of the case. They understood what was needed to organize a smooth workflow. They had passed this stage and were now moving towards efficiency and speed of performance. To this end, both the students and I found the shadowing method too slow and cumbersome. However, I believe this teaching method may have some value in the initial days of the practicum and resolve to use it in subsequent practica.

### Week Three

Practice continued the third week with the students focusing on remembering and implementing their own routine during cases. Word about the research project was spreading amongst the technologists. Participating technologists were discussing the data with other technologists and in doing so were considering how to improve student learning in the department.

The students noticed this immediately. Narif recounted a story that illustrates this well,

It was kind of neat, I was working with a technologist in fluoroscopy and she asked me what objectives I needed to get for the day. She actually asked me what I needed for my book [record book of completed objectives]. No one has ever done that before. I usually have to tell the technologist. So I was able to tell her what I needed and she was really good about letting me do it. She is really good to work with, I really like her.

Chi also noticed the difference in the technologists. The behaviour was so different from previous behaviour that it was remarkable.

One tech started doing a hip and pelvis with me. He got right into positioning and then he stepped back and apologized. He said he was sorry, that he had just jumped in, that he did not mean to do things that the student needed to practice. No one has ever done that to me before.

Kelly was making great progress. New challenges were pursued, even if only so far. With increased confidence Kelly may extend challenges even further.

The other day I assisted with a clavicle x-ray. We haven't covered this at BCIT, but I am still interested in getting experience in this because I know that it will come up in Level Two. I put the cassette in place and talked to the patient and things, but I felt I might get in the way if I helped with positioning the tube and the patient. I felt that because I haven't had the experience, I wasn't much help. But I agree that the principles of aligning the tube and the cassette and patient positioning are similar across many views. Discussing the case before the patient enters the room and doing a mental rehearsal should be all that is required in allowing

me to position for a view that I haven't done before. It's a matter of asking the right questions of the tech and being able to mentally visualize the positioning. Trying to position is more helpful to learning than simply observing.

Fsai was really starting to enjoy the practicum. The enjoyment came in gaining some control of the examination – some autonomy.

I enjoy being the lead when I am doing cases, because then I can make my own decisions. If it is the wrong decision, I'll learn from it. Yesterday, after I did my evaluation, the tech just let me go for it. I did everything, centring, positioning and all, and I did not have the "security blanket" of the tech right there. When I was ready the tech told me just to take it. When I took it it felt so good because I could see. There were no adjustments, no touching, just me and the patient. When I got to hang it up, I could see for myself where I could improve. I was able to make note of the things that I would pay attention to on the next KUB [abdomen] I did.

I find it's like a broken record when the techs keep telling me to centre here or that this is wrong. I always have this curiosity of what if I had centred where I first intended, would the resultant radiograph be so wrong. I know the techs are right but maybe I am right too, or at least close enough to produce a diagnostic film.

Kelly feels a sense of belonging and is now beginning to have fun. This student is also verifying the chosen career.

I'm starting to get the feel of what it is to be a radiographer. It feels right and I feel I have chosen the right profession for me. I love the fact that we combine working with people and



working with technology.

I'm starting to get a rhythm or routine. This has only happened through practice and feedback. I hope I can live up to what I hope to be. I hope to achieve the level that I wanted for myself when I first started the program. I think that it is a hard thing to do. By paying attention to getting my routine down pat, I have improved my radiography and it has helped me to get more cases, which in turn has helped me practice my routine.

I have worked hard in the last three weeks. I've had a great time here, but it will be great to get some time off. I think that we've all worked hard, it's been a great experience. It's a bit of a landmark for us because it's the first time we've done something for our career. It's exciting and it's something I'll remember for a long time.

Chi analyses a situation. Understanding bad behaviour as a by-product of stress, prevents this student from being personally offended by the behaviour. This allows the student to continue personal endeavours towards learning, rather than withdrawing or feeling disliked by the person.

If one person is in a really bad mood and is not being nice, it disrupts the whole department. It's just the stress. They know they have to get all this stuff done, it might be really busy, there are lots of things to do and they are falling behind, it's maybe not their fault but it's just the situation. How you handle the stress is important to everyone. Sometimes it's very hard, I understand that now. When someone's hurrying you, it's important to communicate that you are doing your best and going as fast as you can.

Chi was also enjoying the practicum. Confidence has grown and is showing and the technologists are responding by giving the student more responsibility and independence.

I like seeing new stuff. Yesterday I saw a shoulder and a mandible [x-ray examinations]. I find that I am more on top of things now. I find there is a big change in me and in the techs attitude. The techs are more in tune with what they should be signing and what their involvement is - they are standing back a lot more this week, I've noticed. I love the chance I'm getting now to do the positioning. I found that in the previous two weeks I was not really allowed to do the positioning myself. Even if I touched the patient I didn't feel it was really my work because the tech tidied up the positioning for me.

Narif was also figuring out some things. Able to analyse interactions with patients, this student sets out goals to work towards.

I do all right with patients but I guess that I am just not fully comfortable working with the patients as of yet; so I guess that it will just come with time. Sometimes you find when you explain to them how to do something, they do something else. I think to myself, "OK maybe that's not the best way to explain how to do that." You have to be very specific, how you want them to sit, which way they should face and that sort of thing.

What I have found in OPD [Outpatient Department] is that you have to work with what the patient can do. You can't make them do something or turn a certain way if they can't do it - its going to hurt them - so you have to work with what they can do and sort of do your best. You have to ask your patients all the time what they can do or if they are in pain because they are the ones who can tell you. It's hard to judge a patient's pain threshold. A radiographic position might hurt some people but they may not say anything.

The enthusiasm and delight sparked by incidents in the practicum comes across in Narif's third interview.

I did a lady in room 72 and she was 100 years old. I couldn't believe that she could do all that she did. She was fully there, she was blind, yes but I guess at that age something has to go. She just amazed me. I see people that are twenty or even thirty years younger that are in a lot worse shape. It was kind of neat because I had never worked with a blind patient before. I had to really think about what I had to tell her in order to get her on the table, like where the footstool was etc., and keep her informed of exactly what was going on.

### The Third Planning Meeting

Again the technologists were not able to attend the planning meeting. The meeting followed our usual format. During the brainstorming session, our comments seemed to all point to our being welcomed into the department and making friends with the technologists. The comments spoke of how we had made our presence known and demanded attention and of the legitimacy of our own agenda. Having worked so hard in the last three weeks to get where we are now, surely its time to reap the rewards.

One suggestion for the plan for next week was to "rub off the rusty edges" (Kelly's comment). To me all the students' comments pointed to a plan for fun. Not to just sit back and enjoy but to take pride in our accomplishments and reap the benefit of our efforts. I wanted to acknowledge a job well done.

"Fun" as a plan was not accepted readily by the group - wholeheartedly. But when "controlled fun" or "efficient fun" was put forward as a plan (again by Kelly), it was pounced on by

the others. I think this reflects our work ethic. We are still focused on the caseload requirements and find it difficult to allow any slacking off.

But there is something more here perhaps. There is the perfectionist streak. Never being quite satisfied with our own performance, never taking credit, always finding the flaws in our performance rather than the pieces of brilliance. In reflecting on our practice it is surely important to find what is good along with what is bad. Identifying the good allows us to promote more of it. Like positive self-talk, taking pride in the pieces of brilliance in our practice helps us grow in confidence. Through this growth we are ready to meet even greater challenges.

Further revelations and insights into the mystery of the student's reticence about the formation of last week's plan came during the interview with Chi in the third week.

I didn't really know how to apply the plan this week because I've been trying to perfect my routine [sequence of tasks necessary to complete the x-ray examination] from day number one. Its really just trying to think about what needs to be done when you've got the requisition in your hand. From day one I know that's what I've been trying to get - a nice smooth flow of the way things should be.

How do you implement a plan you have been working on all along? By paying special attention to it, it will improve. Calling it a plan or a group goal gives it this special attention; it gives it more authority over the other ideas milling around our minds. Narif put it like this,

I've really focused on getting the routine down and not having to be reminded of any step in the sequence. This focus has helped me to learn and to get better at radiography. The technologists have helped me a lot in this. They quiz me. "Have I pre-set my technique?"

Chi was starting to implement the plan. This student astutely notes that when under stress the "routine" falls apart.

Our plan for the week was perfecting our routines. When I have the time my routine works well. When it gets busy or there is a difficult or unusual case to do, I sometimes forget some step like pre-setting my technique. Its just experience, the more you do the better you get. I catch myself remembering something I forgot to do in the middle of doing something else.

Kelly assessed the progress of last week's plan. Complacency about mistakes in performance may limit this student's efforts.

The plan for the week to get a routine is OK. I think I've got it - we've had three weeks now to practice it. I'm not saying that its perfect but its a huge improvement over what it used to be. There are still times when the tech needs to remind me of things that I've missed.

Fsai has also been thinking about last week's plan. Strategies have been tried and evaluated. Fsai describes a current strategy.

It has helped me to take twenty seconds and go through my routine and then make sure I do the routine during the case. I want to have my own set routine, like cassette, technique, etc. I just keep saying my routine steps over and over and then when I go to do the case, I take a step back, say my routine and then I do my routine. And that's how I'm going to get it exact all the time. It's not going to be exact all the time but I'll have the foundation. I'm not always

allowed to take twenty seconds to mentally rehearse my routine, sometimes I have to say it once real fast and then just do it. I say it out loud; I talk to myself, so that the tech. knows what I am thinking. I did this in the emergency radiology department and the tech. did not rush me, she just stood there until I was finished and ready to do the case. I got a few laughs from another tech. when I said my routine out loud. But my routine has improved. I'm not running back and forth, back and forth, any more.

Students also like to compare progress and share experiences and successes with each other.

Fsai acknowledges peer pressure to weigh performance against other students.

As students we compare cases. I'm really happy for the other students that they are doing so well. Some things I find I have more experience with, certain cases and exams. I find that I just want to know where the other students are so that I can know if I'm doing OK and keeping up to speed.

Kelly has also compared performance with the other students. Anxious to deny any competition among the students, Kelly enjoys holding the leading position.

I hope I am not making the others feel that I am getting ahead of everyone else. It's just that the others ask what I have done and I tell them. It's not a competition. As far as I'm concerned all four of us are ahead of schedule. I've been in OPD [Outpatient Department] a lot and that's one of the reasons I've managed to get so many extremities [arm and leg examinations]. It really depends on where you are scheduled when the cases come in. I've been really lucky. No one's better than anyone else is at this point, that's for sure.

Confidence is important. Some students lose confidence after having a bad experience with a patient or a tech. They need a little boost and some encouragement. They need reassurance that they will get the cases they need and I think it helps when I share my similar experiences and tell them how I dealt with it. It's important not to take things personally, to swallow your pride and to get on with it.

Chi reported another purpose of student collaboration. Trying out others' strategies, finding out how others deal with problems helps Chi expand the arsenal of strategies at hand.

With having a group goal I could talk about it to the others and find out their experiences and how they dealt with it. If they had had a bad day we could talk to them and share our similar experiences with them. It makes you feel better talking about your experiences with each other. It builds you up too.

In this comparison and sharing of experiences the students discuss the current plan and how they are doing with its implementation. They assess their own progress by comparing it to the other students' progress. The plan gives them a common purpose. Fsai put it like this, "It [the plan] drove us all in one direction because we all had the same weekly plan. This helped us support each other, but if we are all doing the same thing, are we autonomous?"

### Teamwork and Autonomy

Fsai's question perhaps needs to be considered. The weekly plan evolved from the data generated to date in the practicum. It developed out of our thoughts and ideas which were

influenced by the generated data that we had read. But it was chosen as a group. Would each individual have chosen the same plan independently? And was this the only plan each individual chose and tried to implement?

It is unlikely that each of the students would have chosen the same first plan independently. "Pre-setting techniques" was the initial suggestion at the first planning meeting. The group did not unanimously accept this plan. Further suggestions were put forward by individuals until agreement on a plan was reached. Each person had many ideas about ways to proceed in the practicum. Had we not met to discuss these plans or goals, each person would likely have implemented his or her goal without further reflection.

We have also seen from the data that other personal plans were made and implemented along with the group plan. For example, Narif had set a goal to feel comfortable doing x-ray examinations. It was not necessary to focus entirely on one goal. However, having committed to implementing the group plan, each student was working simultaneously on its implementation.

Choosing the same plan or goal gave the students a commonality. It helped them build a support system with each other. It helped to discuss strategies and to share coping mechanisms. It helped them build trust with and respect for each other. It helped them build confidence. They had in effect built a team. The goals of a team are just a bit more weighty, perhaps a bit more important than goals each student may set alone.

Choosing the same goal also gave the students' efforts a greater potency. With four students focused on the same issue and promoting the same plan, the goal was more readily achieved. The facility of achieving the goal in turn promoted the advocacy of goal setting. Here was a way of moving forward, of working towards change.

Promoting the group's goal promoted the individual's goal. The group or team is composed of individuals. It is the individual who implements the goal. It is the individual who



chooses to learn. Taking the action needed to reach the chosen goal is proactive and autonomous. The student is promoting her or his own agenda. This student is an autonomous learner.

In many formal education situations, the instructor establishes objectives and course outlines, but the individual student is the one who is responsible for processing the material. The student who goes above and beyond the course objectives, sets personal goals, seeks answers to unceasing questions is an autonomous learner. Teamwork and autonomy are neither contradictory nor mutually exclusive terms. Choosing a goal even if it is the same goal as a peer with the same learning objectives is a proactive action. Working towards this goal even in the company of others is an autonomous action. In this sense teamwork and autonomy are not contradictory terms. As long as the goals of the group are served by the autonomous action, autonomy and teamwork are not mutually exclusive terms. Only when the autonomous behaviour is detrimental to the group is there conflict. People who wish to do as they please to the detriment of the group are not teamworkers.

#### Week Four

In the last week of the practicum each one of the students reported feeling more confident. Narif put it this way,

It's just a matter of your confidence levels going up the more and more cases you do and the more comfortable you feel doing them. Doing abdomens and chests and a lot of extremities I don't really have to question, "Is it going to come out alright?" because it will. I guess I have felt a lot more independent in a lot of ways because people really let you do your own thing. They know that you can do it, they see what you are capable of doing. They don't try to take

over from you like they did before because they were not sure if we knew what we were doing. Its a nice feeling to almost be doing it all by yourself. I feel that sometimes some patients now don't really know that I am a student, they think that I am one of the technologists.

Chi reported the growing sense of confidence in the weekly interview. Even so, Chi is quick to acknowledge errors.

I'm feeling a lot more comfortable. There are still some ups and downs but they are getting smoother and I hope they will smooth out even further with more experience. Today I forgot to put lead [protection] on a patient and I was just not happy with myself for having forgotten. I remembered after I'd finished, because the patient stood up and I thought, "There should be lead there." So I still forget that every once in a while, so I'm still working on smoothing out my routine.

Kelly also expressed a growing sense of confidence. As the tasks become easier there is a nagging fear that the chosen career will prove boring.

Basically I find that with each successive week that has gone past I am gaining more confidence. I am starting to do things without thinking, starting to get a rhythm. I find the work routine but definitely not boring. I am still fascinated by everything I learn but I can imagine that some days it could get boring, I guess. I haven't felt that way yet but I imagine that any aspect of a job can get boring. There are boring aspects and exciting aspects to any job. It would get much more boring faster for a person who

was not really interested in the work but just doing it for the money.

Fsai also was noticing rising confidence levels. This student believes that the action plan goal has facilitated this change.

What I have found is that my confidence has gone up because I am able to keep one step ahead of the technologist. By anticipating what is needed in a case, I can get it done before the technologist recognizes it has to be done. Having a routine has helped me. I have been working on developing and remembering my routine so that I know what the next step is and I can anticipate the patient's needs.

#### Students' View of the Research

In the interview in the final week, realizing I would have to try to make sense out of all this data, I took the opportunity to ask the students what they thought it all meant. Kelly responded,

To me the research project is about trying to see what effect the practicum has on the students and how they are adapting and changing as the time goes by. I think the plans for change that we set each week could even be emphasized more. I think telling the students right at the beginning that they have to be assertive would make a difference. With those people who are not naturally assertive, you have to show them, do a practice run in front of them with a technologist. In school we should do role-playing. Bring a technologist in [to the school] from here [the hospital] one day and do that, that would be a great idea! If there could be some way to integrate that experience into the BCIT [school] work area I think it would help

us immensely. I think the shock we all felt when we first started at [the hospital] is a hindrance in the beginning because you are reluctant to be assertive with the technologists. Basically I came to [the hospital] expecting stainless steel, bright lights and sterile fields and what I found was old equipment and cluttered rooms. I think if you brought in [to the school] an actual technologist [from the hospital] (I know all the instructors are technologists but it's not the same) it would help prevent the initial shock. The bottom line is to give the students a real taste of what it is going to be like [at the hospital].

Kelly has raised a perennial issue in teaching. Is it possible realistically to simulate the real world for the student? Even if a technologist came to the Institute to speak to the students, the technologist would now be removed from the workplace and so would not act in the same manner as in the hospital. The student would now see the technologist in a different light – as a teacher.

Chi added some insights into the research project, which are valuable and revealing. Chi describes an example of autonomous learning

I think having the interviews and having to really think about what you are doing, and saying it in these interviews, I think that really helps. You may be thinking it but it's not really formulated. When you sit down and talk about it, it's real, and it's out. It makes you really think about what you could be doing, what helps you to learn more.

If you are not autonomous, not trying to find stuff to do, you are missing out on some pretty interesting stuff. Rather than just hanging out in the hallway the other day when there was nothing going on in rooms 10 and 12, I could have just stood out there with all the other technologists and waited for something to happen, but I went into room 17 and it was very interesting. They were doing a J-tube and a tube change for a liver transplant [patient]. There

were two separate things that I watched. I think you have to be interested in what you are doing to be autonomous. To help yourself along you have got to be interested in the field. If you are worried about just getting the book done [meeting the course objectives] you are still learning but you are not taking advantage of everything that there is available to you. I noticed, especially right at the beginning when I was more overwhelmed, that when someone told me to do something, I would just do it because it was easier just to do it. After a while I had no idea why I did that and unless it was explained to me later, I didn't really learn it.

I think it's been really good to set goals for yourself and I feel that this project has really helped me. It makes me really aware of the things I need to improve on, the things I am doing wrong. If we were not doing this project I don't think I would reflect on my practice as much. I also think that the technologists really were helped in that area because they talked amongst themselves and that's been good for us students. It is really interesting to hear what they think, to understand the technologist's point of view. I think that when we first got here I wasn't the only one who was kind of "stand backish" - I saw every one of us doing that. It was really just because it was a new thing and we didn't know what was expected or how to go about doing it tactfully. The more time went on and you communicated more, you found out that they love it when you just jump in, they don't like it when you just stand there and watch.

With having a group goal I could talk about it to the others and find out their experiences and how they dealt with it. If they had had a bad day we could talk to them and share our similar experiences with them. It makes you feel better talking about your experiences with each other. It builds you up too.

Right from the beginning I knew I wanted to have a smooth and level routine. For me my personal goals are to always put on lead [protection], always check for pregnancy and

[pre-set] my techniques. Sometimes I just forget and I have to set it [the exposure factors] when I get back there. Some days I am really good, really consistent. Other days I am flying by the seat of my pants. I think it just gets better though.

In this quote, Chi gives evidence of the autonomy that this student was able to achieve in the practicum. Seeking learning activities elsewhere when no patients were available for “logbook” cases helped the student continue to learn important aspects of radiography. The research question identified to the students that autonomy is an asset to learning. The belief that autonomy is an asset to learning strengthened and encouraged the students’ initiatives towards autonomous actions. The successful outcomes achieved by implementing the group plans of the previous weeks further reinforced the belief in the value of autonomy in learning. Chi has set personal goals on which to work, and has the ability and skill to set further self-assessed goals throughout the remainder of the practicum and radiography career. Chi is armed with a self-improvement package. Narif found the research project useful in the following way:

I think the research project has been good to get other peoples' opinions. You tend to think you are the only one who feels the way you do, but then you read that someone else has had the same experience. The technologists' comments have been really helpful because they help you to know what it is the technologist expects of you or what you should be aware of when working with them. You get their side of the story. They would never say this to your face, no one's going to give you a little spiel on what the student should do.

Fsai also used the research project in a similar manner to Narif. Comfort was taken in acknowledging similar experiences with fellow students. Realization that others were experiencing

what this student felt, boosted self-confidence and determination.

The research data has meant for me that I can get to see another's point of view. This is a different point of view from my own and so my own is broadened. It meant that I could read about others who felt the same as me. It meant that I didn't feel alone. Some of the things I read I had been thinking of but had not been able to say these thoughts out loud. Perhaps they weren't quite formed, but when I read them I knew they were true for me. The research gave me a sense of myself. I felt that my ideas were verified when I read that others felt the same. I found it gave a confirmation to what I said and helped me to build and form my opinions and knowledge.

### The Last Planning Meeting

The week's end meeting and the last day of the practicum came fast. We debated if we needed another plan and whether the plan was to be implemented during the summer, next term or whenever. The students had a great experience at the hospital, they had learned a lot and in the process had changed some opinions and reinforced others. Having come this far, they were somewhat dismayed that they would have to go through it all again, next term. They were buoyed by the thought that it would be easier the next time and that they felt that the biggest hurdle of the first practicum was over. Having "survived" the practicum at one of the major hospitals in the province, they felt they had probably experienced it all. Everything else would be "a piece of cake" in comparison. Chi was able to express the plan: it was to rejuvenate. We all agreed wholeheartedly.

## Chapter 5

### Emergent Themes

The action research project was enlightening. A wealth of information and insights have become evident. Many other insights will reveal themselves as I continue to reflect on past and encounter future practicum experiences. In this chapter I describe the insights and themes that have emerged from the research to date.

I have learned much about the practicum and my understanding of autonomous learning. I have lived through an action research project and have been surprised by the outcomes it has enabled. In the process, I have learned about my practice in regards to the students and technologists and about the assumptions on which my practice is based.

### Facilitating Change

The initial problem that led to the research question was that some students reported feeling overwhelmed at the start of the practicum. When I tried to resolve this problem by implementing changes in the practicum, I realized that changes implemented based on feedback from last year's students do not impact on the incoming student. The implemented change alters the practicum. The incoming students now evaluate the "new" practicum. Changes or improvements suggested by these students in the end of term evaluations would only benefit next year's class.

This situation is less than satisfactory. Neither the students who suggested the change nor the incoming students are satisfied by the implemented change. The students who suggested the change do not see the change implemented because they are no longer in the practicum. Once the change is made, the incoming student does not experience the exact discord that was felt by the previous students and so cannot appreciate the change.



The sense of improvement and progression for the incoming students is at best second-hand as he or she learns from technologists or instructors or a previous year's student what it used to be like. The previous year's students are left with the chagrin of having endured a difficulty or followed a rule that has now been so readily changed.

The action research project gave the students a sense of collaboration and of autonomy. By being able to implement and assess changes that they made as the practicum developed, they gained some control. These changes were agreed on as a group but were implemented by their own actions. The students were proactive. They identified problems and looked for solutions. Implementing the solutions, the students assessed the results and reassessed their situation in the practicum.

The changes that the students made in their action plans were changes that were in their own power to implement. However, changes to the rules and policies of the practicum would necessarily impact on a larger group of people than the three parties (students, technologists and clinical instructor) at one hospital. All students at the other practicum sites, the technologists, clinical instructors, instructors and administrators at the Institute and possibly members who serve on the program's advisory committee may all be stakeholders in changes made to the rules of the practicum. The amount of involvement of this ever-widening circle of stakeholders would be determined by the impact of the proposed change. However, if a vehicle that would allow this type of change and improvement is not available disenchantment and inertia may be the result when the student is denied another opportunity to take responsibility in her or his own world. Providing every opportunity to enable students to be autonomous is likely to reduce frustration and stress in the student. Reducing stress levels, which are unrelated to the specific learning task or objective, helps the student attend more fully to the learning objective. It may be useful to explore with faculty, students, practitioners and administrators what structure can be put in place

to allow for change during the practicum.

In waiting till the end of term to issue evaluation forms we have missed the boat. The student has moved on and cannot experience the benefit of the feedback he or she gave at the request of the program. The opportunity to implement changes as the practicum unfolds is therefore more limited than it need be. Concerns may be communicated to the clinical instructor who in turn will raise the issue with the other instructors and faculty. There is, however, no definite or direct vehicle in place to channel student input and to determine viable solutions. Autonomy is made more difficult for the student. The student is disempowered.

### Preparing the Student for the Practicum

The practicum is a complex learning environment. Many factors are intertwined and interdependent and these serve to make subtle shifts in the environment. Each student's expectations, technologist's expectations and instructor's expectations hold variations that range from minimally different to diametrically opposite. The reality of the practicum unfolds in the negotiation and renegotiations of meaning among the interacting participants.

Our students are prepared for the practicum by instruction in the theory and simulated practice of radiography. The objectives the students are required to achieve in the practicum have been matched to their didactic knowledge. The number of objectives has been matched to the length of the practicum and to the goal of achieving competency. The objectives are explained to the students prior to the practicum and again at the start of the practicum. All has been attended to except how the students are to meet these objectives in the practicum.

Our students, like all people, are unique individuals. Each operates according to personal assumptions, beliefs and values. Personal experiences influence approaches to problems,

interactions and encounters. It is fair to say then that different students will tackle the job of meeting their learning objectives in different ways. Some of these will be effective and some will not. Some will meet with initial success and some will not. Herein lies the origin of the reason that some students feel overwhelmed in the practicum and others do not. Students frustrated with initial unexpected or unforeseen difficulties in the practicum become overwhelmed. Quickly finding effective solutions to these difficulties is essential in getting the student back on track.

Preparation of the student for the practicum needs to include strategies for ensuring success in the practicum. It is folly to assume that all our students have acquired these strategies. The students in the research project were surprised to learn of the technologists' expectations of them in the practicum. These expectations are likely to be somewhat constant from year to year. Knowledge of these expectations prior to attending the practicum and discussion of difficulties experienced in past practica may serve to arm the student with some defenses against the frustrations of the practicum. The expertise within the group of students is a valuable resource. Utilizing this resource in the discussion and analysis of clinical problems will further develop self-esteem and peer support, which will be useful during the practicum.

#### Preparation of the Technologist for the Practicum

The technologist is essential to the success of the practicum. The technologist who shows interest in the students' learning objectives is an asset to the success of the practicum. As Narif found and reported in the research data, demonstration of this interest is rare in the technologist. Failure to communicate this interest to the student may not arise from lack of interest. It may stem from lack of time, a busy workload, unawareness of the existence of student's objectives, or

a variety of personal reasons known only to the individual technologist.

Indeed it would be unfortunate if the lack of this communication stemmed from lack of knowledge of students' objectives. Such a lack is so readily remedied. True the student has a responsibility to communicate his or her learning objectives to the technologist. Removing this responsibility from the student would only deny the student some personal autonomy. A discussion of the expected learning objectives of the students with the staff technologists prior to the practicum would, however, highlight the importance of these learning objectives during the practicum. It would also afford an opportunity for discussion between clinical instructor and technologists regarding problematic aspects of the practicum. It would not deprive the student of the responsibility of communicating specific objectives to the technologist prior to beginning a case.

Discussing the learning objectives of the students with the technologists prior to the practicum alerts the technologist to the importance of his or her role during the practicum. It also removes at least one reason (lack of knowledge of the learning objectives) why the technologist may not communicate interest in the students' learning objectives. Not only is knowledge of the learning objectives gained but the status of these objectives is heightened by the attention placed on these by the hospital (in devoting staff time) and the program (in supplying instruction).

### Feedback from the Radiograph

Another emergent theme from the research is the ownership of feedback from the radiograph. When doing an x-ray examination, if the student's radiographic positioning work is moved or changed in some way by the technologist, no matter how little, the radiograph becomes the work of the technologist in the mind of the student. Any feedback gathered from the

radiograph as far as correct alignment of part to film, proper positioning of the patient or appropriate density and beam restriction, becomes relevant to the technologist not to the student when the technologist changes the student's work. The student does not fully benefit from the feedback gathered by visually inspecting the resultant radiograph because the student does not feel that the resultant radiograph is her or his own work.

Not all technologists are aware of this phenomenon. Many technologists believe it is his or her responsibility to ensure exact positioning. Indeed it is the technologist's responsibility to supervise the student in order to prevent taking unnecessary repeats. Knowing when a radiograph will be diagnostic is the responsibility of the technologist. This leaves a range or margin around which a student can work towards improving her or his skills. Unless the student is given the leeway to improve within this margin, the student will not experience the concrete feedback gathered from the radiograph when the student has completed the final positioning.

Even positioning that is judged by the technologist to be inadequate could be corrected by the student prior to exposure. If the technologist alerts the student to the problem and allows the student to correct the error, the student still feels somewhat responsible for the radiograph. This allows the student the chance to benefit from the feedback of the resultant radiograph.

An education session with the technologists prior to the practicum can be used to discuss such issues as visual checking and to more clearly define the supervisory role of the technologist when working with the student in the practicum. As we found in the research data, exchange of viewpoints between technologists and students leads to new-found insights. Further increase in the opportunity to explore these viewpoints and exchange ideas will enable a closer understanding of each other and serve to build trust and respect.

Discussion with the technologists may help us begin to explore the actual learning environment provided by the practicum. What influences the student's capacity to learn? How

can we enable learning? What makes learning more difficult? What makes for a safe learning environment and what makes for a conflictual one?

### A Safe or Conflictual Learning Environment

Learning occurs most effectively when the learner is in a safe environment (Knowles, 1980; Maslow, 1954; C. Rogers, 1969). Learning occurs when the learner experiences a disorienting dilemma or a conflict with her or his beliefs or assumptions (Freire, 1970; Mezirow, 1991; Schön, 1983). These two statements seem immanently sensible and yet they say the opposite. On the one hand, the learner is safe and secure and on the other is confronting a conflict.

In the practicum many conflicts arise. The student is assaulted with his or her initial lack of knowledge on just about everything to do with the practicum. There is so much to attend to in the clinical environment new to the student. The question is where to begin.

It is in this question that the student may become overwhelmed. The student has a plan of action outlined by the learning objectives. The technologist practitioners in the practicum do not have the same plan. Each one of the technologists has his or her own idea of what the student should do and learn. At worst this can amount to fetching and carrying for the technologist. At best the technologist provides a learning environment for the student. When communicating and working with the student, the technologist imparts her or his agenda to the student verbally and through body language. In this way, the technologist communicates his or her own needs to the student. Each technologist is likely to have a different concept of the student's role. All these different concepts are communicated to the student as the student works with one technologist and then another.

Students in response to the technologist's authority may feel compelled to comply with the technologist's needs at the expense of their own plan, the learning objectives. In so doing, the student sacrifices personal autonomy and affirms dependence upon the technologist. The technologist in effect in this case trains the student to mimic her or his practice. The student is thus socialized into the workplace.

The student learns well in this apprenticeship-type environment but unfortunately the technologist is not constant. The heavy workload and dynamic situation in a busy hospital demand that technologists are reassigned as needed to cope with the ever-changing situation. The student, because he or she is not responsible for carrying a workload and is competent only in a limited area within the hospital, is expected to remain in the assigned area. Another technologist becomes available to work with the student. This technologist has a slightly different method of practice. The student has now to begin to learn this technologist's preferences. This scenario may be repeated several times in one day and again the next day and so on.

Each time the student senses that the technologist is dissatisfied with the student's performance because it is not the way this particular technologist prefers, the student faces a conflict. These conflicts can mount up and suddenly overwhelm the student. Frustrated with the enormity of the task of memorizing each technologist's routine, the student may become discouraged and defeated. This in turn may prompt the technologist to give a poor report of the student because the student seems confused and unhappy.

Contrast this with the student who is able to communicate her or his learning objectives to the technologist. The technologist is obliged to enable the student to meet this objective (Kelly told us that the technologists accommodated readily when told by the student what objective was needed). The student has a clear understanding of the tasks required to complete

the objective - having practiced these tasks in laboratory sessions at the Institute. The tasks are listed in the student's objectives logbook. The technologist can read the tasks that he or she should evaluate as the student performs the objective.

In this way the student builds her or his own practice. Feedback can be received from the technologist either at the end of the performed procedure or during the procedure. The student maintains a certain autonomy. The student gains confidence in his or her ability. Learning is accomplished through experience. The learning objectives are met. The student feels he or she is making progress.

Conflict is not lacking in this last scenario. With each task the student must apply theory to a new setting. In making this application of knowledge in a novel situation, the student is confronted with conflicts and questions. Some of these can be solved through reasoning and some through discussion with technologists and colleagues either during or on completion of the procedure.

The conflict is however somewhat controlled and to some extent anticipated by the student. The students have worked hard at the Institute to arrive at their current level of knowledge. They would be the first to admit that they do not know it all. They expect to have questions in the practicum.

They do not expect to have so many questions that they become incapacitated. Students who follow the former scenario where the technologist expects the student to mimic her or his practice, may become so overwhelmed that they are unable to function at their best. Confused with the conflicting information gathered from several technologists, the student makes mistakes. Only exceptional students have the ability to remember each technologist's preferences (for instance in the technologist Inez's story who recalled as a student memorizing each technologist's preference).



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Tourey, one of the participating technologists, suggested that the student should be assigned to a technologist all day. Tourey has recent personal knowledge of the radiography program and so perhaps has an acute sense of its failings. This solution would certainly remove the overwhelming conflicts facing students who work with several different technologists in one day. Solving a problem with the practicum in this way, however, strips the student of some personal autonomy as the student becomes dependent on this one technologist's availability to do cases. Also the frustrations associated with remembering every technologist's preferred method of practice would still be a future problem, unless the student works with one technologist for the entire practicum. Should the student work with only one or two technologists during the entire practicum, the student misses out on the vast wealth of resources available in the diversity of the experience of all the technologists. Wisdom dwells in the ability to hold several points of view (McCloskey, 1996). The student also misses out on the opportunity to build her or his own practice based on theory. Owning their practice enables students to commit to and justify their actions, to evaluate their own actions, and to strive for improvement.

Knowledge of the learning objectives for the practicum is essential for a successful practicum only if there is a way of communicating these objectives to the practitioners. Our program expects the student to communicate their needs to the technologist. By initiating this communication the student grasps autonomy.

Erstad et al. (1997) recommended that practitioners at the clinical site also have a clear understanding and commitment to the learning objectives of the student. When both the technologists and the students have a good understanding of the learning objectives for the practicum, conflicts that arise as the student meets each objective are expected and anticipated. These conflicts initiate and facilitate learning. These are the conflicts necessary for the learning process outlined by Freire (1970); Mezirow (1991) and Schön (1983). When the student is a

legitimate and accepted participant in the workplace a safe learning environment is created. In this way the learning requirements of Knowles (1980); Mazlow (1954) and C. Rogers (1969) are met. The student can cope, function and learn in this environment.

However, when technologists impose their own objectives or agenda on the student that are in opposition to the student's objectives, unexpected and unanticipated conflicts arise. As these conflicts mount with each technologist encountered, the learning environment becomes confusing and intimidating. The student gets overwhelmed. Although a certain amount of conflict or stress enables learning, uncontrolled and unresolved conflicts and the associated stress block learning and peel away any autonomy the student may dare to seek.

### Seeking Autonomy

In the medical radiography program, the student is obliged to achieve a certain performance both in didactic and practical skills. Performance in the practicum is assessed by meeting learning objectives and by reports given by the technologists and clinical instructor. Performance is assessed frequently. While every effort is made to help the student improve, when performance is inadequate the student fails the program. Some students have worked for years towards admission into the radiography program. If a student fails the program, it would catapult the student towards seeking another career choice with the accompanying hurdles of acquiring the appropriate prerequisites and admission. So much is resting on the student to do well in the program. In such an environment is it realistic to expect the student to be autonomous?

The student's future in the program depends on meeting the learning objectives and gaining the approval of the staff technologists in the form of acceptable reports. The student may

interpret this to mean he or she cannot question or discuss issues with the technologist. The student will wait for direction from the technologist if this is the case, rather than develop his or her own practice. In this position of subordination the student's grasp on autonomy is tenuous.

In a situation where the student must continually seek to impress the technologist, the student is not in control of her own destiny. The student's fate hangs on change. The message to the student is, "You are not acceptable as you are. Do it differently from how you now do it. When you change you will be accepted as a technologist." This stressful situation may lead to anxiety and to poor performance. The cycle becomes complete for failure. Too much stress leads to being unable to cope or function.

On the other hand, lack of stress leads to apathy and boredom. The correct balance of stress is necessary for growth and change. Seizing the little autonomy open to the student may serve to help the student regain some control. With this control comes regained self-esteem and stress reduction. Working at acceptable stress levels enables learning. Kelly admitted this in the second week of the practicum. "I think it's good to be at an optimum stress level. Last week I was too stressed but this week it's just right, it's good stress." Kelly feels subordinate to the technologists. "I still put the technologists up there on a pedestal. Last week I was apprehensive of the technologists, but now I find I can approach them." Kelly has found that communicating the learning needs to the technologists helped get the objectives accomplished. The technologists responded positively to Kelly's needs which in the end was no surprise to the student. Kelly says in week two, "It hasn't been as bad this week as last. There have been no surprises this week. It's been a big change from last week. I did that thing about being more assertive and communicating with the technologists. Every one of them accommodated me. I kind of knew inside that they would." The opportunity and encouragement to seek autonomy helped Kelly to lower stress levels and attend to learning.

In seeking autonomy the student moves a little closer to becoming a technologist. Technologists are autonomous practitioners able to independently perform radiographic examinations within the workplace. Those who fail to achieve this level of autonomy may be lacking competence. The technologist who never quite completes a case or needs help with the most straightforward examination or who avoids performing certain (perhaps more difficult) radiographic procedures causes problems for the department. Other technologists have to carry the load.

Technologists value autonomy. Relying on each other to carry the workload equally and in a respectful and friendly environment, technologists work independently and interdependently. Participating as an equal within the society of the workplace is an important value.

What is true of technologists is also true of other members of the health care team within the workplace. Porters, electricians, nurses, cleaners, managers, doctors, and patients all have their part to play in contributing to the grand scheme of the hospital. Each works or functions independently and interdependently.

Students also have their role in the hospital. Autonomy is to be seized in order to step up to full participation in this role. This role is taking the responsibility to be all that one can be independently and interdependently in a friendly and respectful environment. In seizing autonomy the student is able to initiate the actions necessary to become a technologist.

### Knowledge of Objectives

Erstad et al. (1997) found that student knowledge of the learning objectives of the practicum is essential for a successful experience. Our action research study showed that knowledge of the objectives did not prevent feelings of being overwhelmed in the student. The

radiography students had a good understanding of the objectives. These were discussed in a group session prior to attending the practicum. The objectives were again reviewed on the first day of the practicum. The students each had a copy of the objectives along with the list of tasks they were expected to perform in order to meet each objective.

Knowledge of the objectives was not enough to prevent some students from being overwhelmed initially in the practicum. The students began to realize that two other factors were required of them. The first was that the learner needed to take action. Mezirow (1995) states, "Action is an indispensable phase of the process of adult learning" (p.58). Chi made this realization evident in the data by saying, "If you are not autonomous, not trying to find stuff to do, you are missing out." Meeting objectives was not going to happen by osmosis. The student would have to participate, have to interact with other members of the department. Narif knew it would take action. Goal setting and reviewing technical knowledge were two strategies Narif identified to assist with meeting the objectives.

The second factor was the decision about the type of action necessary. What would help the student meet his or her objectives? The students decided on communications with the technologist. Making this decision themselves boosted the students' confidence because it gave them back some control. Making this decision as a group also boosted the students' confidence because they shared responsibility and gave each other support. Implementing the decision or goal again boosted confidence because the concerted effort of all four students made their voice stronger and more powerful. The students could see the results practically right away.

Once the action had been taken and the students were able to reap the benefit of their action, the power of the action was realized. Students could see that they themselves had taken action that made a positive impact on their own learning. They had demonstrated to themselves that they could be autonomous learners.

Qualification is called for here. Some of the students already were autonomous learners and would continue in this vein. Some were occasional autonomous learners and perhaps with the positive results of their recent actions would be more ready to pursue further autonomous initiatives. Some, even with the positive feedback received through their own actions, were still not convinced that autonomy was an option for them.

Values, assumptions and beliefs are embedded in our actions and ideas. One experience does not change forever habits that have taken a lifetime to build. Some students still had a way to go. Here again is a clue to the difference in reports of feeling overwhelmed in the practicum. Students who initiate autonomous actions to aid learning may be less overwhelmed than those who do not.

This year's students were neither more nor less initially overwhelmed than students of other years. The action research process gave the students an opportunity to jointly decide on actions, implement them and evaluate the effects of these actions. All the students were therefore able to reap the benefit of the experience and expertise of those students who already use appropriate coping strategies. In the community of their fellow students confidence grew and strategies were tried which I believe helped the overwhelmed students more readily find solutions to their problems. These solutions were perhaps developed faster and more effectively because of the atmosphere of community, support and knowledge sharing that was fostered by the action research project.

### Themes on the Practicum

Hannafin and Land (1997) have argued that the practicum offers unique learning possibilities. In the diverse array of novel situations that arise in the practicum students can

experience continuous practice in problem-solving, reasoning and critical thinking. Themes that support this position emerge from the action research project.

The first of these themes is the concrete nature of the practicum compared with the laboratory sessions at the Institute. In the laboratory, students practice radiography positioning on their classmates. Perhaps initially, when students are just getting to know each other, the positioning practice may be more realistic. As students come to know their classmates, more and more assistance is given to the student “positioner” by the student “patient.”

In time repetition of the same format leads to lack of authenticity and realism. Some students feel they are play-acting, going through the procedure of saying the expected words to another student without experiencing the interaction of the real situation. Fsai talks about this in the first week of the practicum.

In the labs at BCIT I had trouble articulating the instructions necessary for positioning. Here at the hospital it's different. It's not acting. The patients really have to know what to do, so I just tell them. The patients don't automatically go into position like my classmates did in lab. When I started taking x-rays at the hospital I didn't feel uncomfortable, I just knew what to do.

This authenticity is missing in any simulated experience. Learning out of context becomes abstract. Although in laboratory sessions the students are asked to act uncooperatively or as though they are in pain, it is still acting. The practicum allows the student to interact with the patient in an authentic manner. In this way the student builds reasoning skills and practices problem-solving.

In the practicum, however, students can only interact with the patient if the technologist

allows the student to do so. A second theme arising from the research is the authority of the technologist to allow the student to practice radiography. One of our research participating technologists told me how this unfolds. "I remember one case I did the other day with a Level One student. It was a knee x-ray on a patient from the ward. I decided to let the student do everything." Jamie is pleased with the student's performance but adds, "It wasn't the first case I had done with the student that day. The student had learned from the first case. The first case we did together. I demonstrated everything and explained what I was doing as I went along." Some technologists need to be reassured that the student has the ability to do the case before allowing the student the freedom to try. The reticence demonstrated by the technologist may stem from a lack of knowledge about the student's preparation for the practicum and actual capabilities. Increased communication between student and practitioner and Institute and practitioner is indicated.

Even when the technologist gives the student permission to do the case, the student may hesitate. A third emergent theme is the apparent reluctance of some students to start cases. Fsai said, "I feel I need twenty seconds or so before doing a case so that I can gather my thoughts and mentally plan the case." Students who hesitate and seem reluctant to start a case may hastily be thought to lack the necessary knowledge. Technologists pressed for time and x-ray room availability may decide to proceed without waiting for the student.

The confident student may be able to express the need to mentally rehearse the procedure to the technologist and so seize autonomy in learning. Recognition by technologists of this need in some students would help alleviate misunderstandings by both parties. Discussion of the particular characteristics of the case prior to springing into action would serve to align the technologist's and the student's thoughts.

Another theme that emerged from the research was the students' surprise about doing



cases on the first day of the practicum. The students knew they were going to the clinical setting to practice radiography, but even with the preparation during lectures and labs. and thorough clinical orientation sessions at the Institute, some students were still taken by surprise.

Assumptions play a significant role in influencing expectations. The student's expectation of a gradual orientation to the practicum is an assumption that was not fostered in clinical orientation classes at the Institute. However, the learner as the passive receiver of knowledge at the Institute may well expect to be led by the hand in the practicum. Students who expect the hospital practicum to unfold like the scenes in a TV medical drama may hold an assumption that there is no reason to question until the first day of the practicum.

### Support for the Program

The amount of support for the teaching program by the technologists at the hospital somewhat surprised me. This was initially evident from the positive response of the technologists who participated in the research project. Although, no one responded when I posted a notice of request, I had no refusals when I personally approached individual technologists. When I asked the technologists to spend some time talking to me about the program, immediate approval was given. Each technologist gave freely of her or his own time (the workload was too heavy to allow time during the technologist's shift). Reading of the data was promptly carried out by the technologists although it was sometimes difficult to get transcribed passages returned with approval because of shift changes and casual hours.

The technologists' willingness to contribute to the research pleasantly surprised me as did the technologists' care and concern for the students which was readily evident in the interviews. Their commitment to the program was seen through the thought and reflection given in trying to

accommodate and include the student in the midst of the hustle and bustle of the x-ray department.

Surprising too was the rapidity with which word of the research project spread through the department. Technologists who were not participating in the research asked me about the project. Students found that even non-participating technologists were complying with students' needs. The participating technologists were spreading the word about the research project and communicating the students' needs to the non-participating technologists. This shows that even the non-participating technologists were interested in the radiography teaching program and wanted to improve the students' experiences in the practicum.

I seemed to have assumed that the Institute had a lack of support at the hospital sites. The assumption that there was less than ideal support may have grown from an uncritical acceptance of stories and accounts that convey negative messages. The insight that this is not so has reminded me of the importance of critically examining the available evidence and basing beliefs and actions on such evidence, rather than on rumours.

My teaching practice as a clinical instructor in the radiography program relies heavily on the technologists at the teaching hospitals. Without their help and cooperation my practice of necessity would be very different. This research project has also served to highlight the interdependence between my practice and the technologists.

### Conclusions

My initial research question stemmed from a curiosity to understand why some students felt overwhelmed in the initial days of the practicum. Why were the remedies I initiated so ineffectual? If autonomy is an important characteristic in the technologist who is a team player,

how can I promote student growth as an autonomous learner in the practicum? These are questions that have driven the research. Now I need to look at the effect of the research project on student learning in the practicum.

### Autonomy through Action Research

The action research project promoted learning in the practicum. In particular, it promoted communicative learning. Mezirow (1995) says, "Communicative learning ... involves understanding what somebody means or the process by which others understand what you mean" (p. 49). By exchanging the ideas of the students with each other and with the technologists, communicative learning was promoted and meaning defined. As each read what the other had to say the atmosphere of the practicum changed.

Early on in the practicum Fsai said,

I found lateral views of the knees done completely differently by two different technologists. One crosses the unaffected leg over the affected one, the way we are taught at BCIT, and the other one leaves the leg behind the affected leg. How do I deal with this? I feel I can't say anything to the technologist. I just have to accept it and try to remember which technologist wants what the next time I'm working with them. When I did the positioning, I felt I was positioning all right and I think it would have worked well. The technologist changed everything. I wish I could just be allowed to see how my positioning would come out.

Later on in the practicum Narif told me,

It was kind of neat, I was working with a technologist in fluoroscopy and she asked me what objectives I needed to get for the day. She actually asked me what I needed for my logbook [record of completed objectives]. No one has ever done that before. I usually have to tell the technologist.

Chi was also surprised by the change in the technologist's behavior.

One technologist started doing a hip and pelvis with me. He got right into positioning and then he stepped back and apologized. He said he was sorry, that he had just jumped in, that he did not mean to do things that the student needed to practice. No one has ever done that to me before.

The exchange of information between the students and the technologists had served to advance the students' agenda. The communicative exchange between the technologists participating in the research project and the rest of the technologists served to spread word of the students' requirements to the rest of the staff technologists. In this way the action research project advanced the cause of the individual student.

Not only the exchange of information between the students and the technologists, but also the interviews themselves, helped the student learn. One student said,

I think having the interviews and having to really think about what you are doing, and saying it in these interviews, I think that really helps. You may be thinking it but it's not really formulated. When you sit down and talk about it, its real, and its out. It really

makes you think about what you could be doing, what helps you learn more.

Communicative learning was also apparent in the interaction students had with each other. One student put it this way;

With having a group goal I could talk about it to the others and find out their experiences and how they dealt with it. If they had had a bad day we could talk to them and share our similar experiences with them. It makes you feel better talking about your experiences with each other. It builds you up too.

My initial notion to help the students in the practicum was to encourage their autonomy in learning. Autonomy is certainly an important part of the issue but not the entire issue. Finding a channel of communication that will reach the technologists and influence the decisions they make about allowing students to meet their learning goals is perhaps the key that will achieve greater success. The students have many questions for the technologists in the practicum. The technologists have many insights to share with the students. In the day to day experience of the practicum where student and technologist work side by side performing radiographic examinations, there is (perhaps surprisingly) little or no avenue to promote communicative learning. The research project served this function by exchanging written reports of students' and technologists' perspectives and beliefs about the practicum. In this exchange the students learned the role that the technologists expected the students to fulfill. The technologists learned the role the students expected of the technologists. I wonder how I can precipitate this communication in future practicum assignments.

Had the research project not been part of the practicum what recourse would the students

have for exchanging points of view with the technologists? During coffee breaks and lunches the students tend to group together for support, denying themselves the opportunity to express their issues to the technologists. During times in the department when there are no patients waiting for x-rays, the students are expected to perform tasks such as reading policy manuals and stocking rooms. When any conversation is initiated among the technologists and students it is usually about their personal life and background. This, of course, is still of value but it perhaps does not directly promote the student's issues. When the student and technologist perform an x-ray examination together the exchange of conversation is restricted to professional talk among the patient, student and technologist.

There seems no opportunity unless one is implemented. The implementation of communicative learning and information exchange needs to occur earlier so that each party is ready and prepared for the practicum. Informational sessions with students and with technologists are indicated prior to the practicum. Perhaps a copy of the data collected in the research project would serve to help each party in future practica understand the other's point of view.

### Theory of Communicative Action

Jürgen Habermas, a member of the Frankfurt School of critical theory, believes that the learning process takes place through the acquisition of both technical and practical knowledge (Welton, 1995a). While technical knowledge is concerned with facts and technical information, practical knowledge is concerned with how people want to live their lives. As each person jostles to meet her or his own needs and more and more demands are made, technical controls have to be imposed which increasingly encroach on people's lifestyles. Practical knowledge is

used to negotiate one's own interests within society. Welton uses Habermas' theory to show a way in which adult education can be used to help humanity find its way towards a better life for more people. He calls for an "autonomous and exuberant civil society" as a means of swaying the public sphere in order to bring about the desired change (Welton, 1995b, p. 155).

Here I need to make clear my own interpretation of civil society. In society individuals face problems and decisions. Through communicative action discourse around these problems and emergent decisions, begins to activate families and friends. This leads to further discussion in ever-widening fields, such as, schools, places of work, clubs and eventually may lead to the formation of a social movement. As the communication and discourse grows the media join the debate and elected officials begin to ask questions of the government. The debate may bring action in the law courts and eventually in the government. In this way civil society is the agency through which deliberate democracy can function.

According to Habermas, (as cited in Welton, 1995b) this is the legitimate way in which change should occur in society. Through this process we each have our voice heard, it is democratic. However, there are ways in which this process is bypassed and overridden. In positions of subordination voices are suppressed and silenced or devalued and ignored.

Only if each voice is given an equal opportunity to be heard and be considered in the decisions that are made which affect society will this process function well. Some voices, however, are more influential than others. The "game" has now boiled down to a contest between those in a position of privilege. Only those in an élite position have the power to influence governmental decisions that will impact on the quality of lives of all, even those outside the élite.

Another way in which the deliberative democratic process is stymied is by the persuasion that government is self-structuring. If we believe that we have no influence in the decision-

making process because the process is a self-governing machine that runs itself, we tend to give up. Believing that the system is to blame is self-defeating. Choosing to take the stand that we are powerless against the system eliminates our voice from any discussion or discourse whatsoever.

With the voice of civil society so readily invalidated or dismissed it is easy to become discouraged. But Habermas (as cited in Welton, in press) contends that the communicative process of civil society is unstoppable. Welton (in press) says it this way, "The lifeworld reproduces itself through the medium of communicative action" (p. 5). The very fact that we live in the world with others means we will always talk about issues that concern us. In sharing our concerns we build community which may propel the issue into the public sphere and give it a privileged voice. This will work only if we are energetic in discussing concerns and interests with others. In this way we make up, indeed we are, the civil society.

As part of civil society we can take both an offensive and defensive stance. On the offensive we can seek to raise issues that are of concern to a large part of our community. We can endeavour to work together to clarify the problem by gathering information, deciding on solutions and on ways in which to implement these solutions. In this way we form a movement with its own goals and plans. This movement is in a stronger position to persuade the public sphere and influence the decisions of the government or the decision-makers.

The defensive mode of civil society is designed to keep open the channels of communicative action. Those in an élite or dominant position to influence decisions tend to monopolize the decision-makers and dictate the issues to be addressed. The public sphere is alerted to these "élite" issues at the expense of the issues of the community at large. Television, newspapers and radio are blocked as a means of communicative action to grassroots initiatives because they are busy attending to élitist issues. The defensive task of democratic movements in



civil society is to find ways to keep open communicative channels as a means of reaching the public sphere.

Democratic movements generated by civil society cannot influence government without first influencing the public sphere. The public sphere is composed of three segments which are interdependent. "Episodic" encounters incurred through chance meetings may reveal information that becomes a public issue. "Occasional" communications arise where groups of like-minded people assemble to discuss or pursue a certain issue, for instance at conferences. "Abstract" public spheres evolve from the mass media. As individuals grasp an issue in the newspaper or on television across the land it reaches the level of an issue in the public sphere. Each of these three spheres of influence is open to each other and impacts each other. Influencing one segment may lead to influencing the entire public sphere. As the public sphere is persuaded, it can now serve to influence the government or the decision-maker.

How does the civil society act to influence the public sphere within the practicum in an x-ray department? Who represents the civil society in the practicum and who the public sphere? How can we adapt Habermas' theory of communicative action to the practicum in order to explain the unfolding events? The radiography students new to the practicum and workplace are in a position of subordination initially. How do they get their issues on the agenda? How can they ensure the recognition, respect and resources necessary to permit them to pursue their goal of improving their radiography skills?

Recognition, respect and resources are indeed the issue for these students. Recognition that the student has a purpose within the department. This purpose is to improve his or her radiography practice to the best of her or his ability. Each radiographic examination may take the student more time to complete than it would take a technologist, but the student cannot improve speed and skill unless practice on x-ray examinations is permitted. While skill

improvement is sought, the student requires respect as an individual. Respect as an efficient technologist will come when the student is a graduate. The resources that the students need are the x-ray examination cases. The technologist is in a position to permit the student to do these cases or to deny the student access to "hands-on" practice. In effect, the technologist is the decision-maker.

The action research project served to turn the students into "an autonomous and exuberant civic society." By expressing their concerns and problems in the interview sessions, these concerns were in turn typed and circulated to the research-participating technologists. The exchange of information between the students and technologists promoted the students' agenda. Reading the accounts of the students, the participating technologists became members of the "abstract" public sphere. These technologists participating in the research spread word of the students' requirements to the rest of the technologists in the department. The rest of the technologists can be seen as the entire public sphere of the department. Persuaded that the students had legitimate needs which should be met, the public sphere at large (the department technologists) influenced the behaviour of the individual technologist as he or she worked with a student. This technologist was, in effect, the decision-maker who was persuaded by the public sphere of the department technologists to allow the students permission to perform the x-ray examinations.

### Transformation Theory

Larson (1996) gives some insight into the students' feelings of being overwhelmed. She says it stems from a reality check between the anticipation of the experience and the actual experience. When students realize that personal action is required in order to meet the learning

objectives and to be successful in the practicum, this reality check may be overwhelming.

Mezirow (1995) calls this reality check a disorientating dilemma and it is this dilemma that acts as a trigger event to promote action and hence, learning.

Transformation theory elaborates on Larson's (1996) reality check. Mezirow (1995) describes "meaning perspectives" and "meaning schemes" as structures through which we make meaning. These schemes and perspectives are formed through our beliefs, values and assumptions. As we learn, our meaning structures have to adapt and change or "transform." A dilemma arises when new information conflicts with existing information now processed into meaning schemes and meaning perspectives. This dilemma acts as a trigger event, which precipitates the personal action necessary to change or transform.

Some students expect or anticipate the need for personal action in the practicum. They expect to pursue learning and to adapt and change. Others have not fully anticipated this required action. Chi was aware that action was required, "I feel I'll have to be really assertive when I go into "general" [the main department] although I don't like to be overbearing." Kelly on the other hand was not fully prepared, "I expected changes - there was more than I expected."

Transformation theory identifies a disorienting dilemma as the event that triggers learning. The feelings of being overwhelmed some students experience are disorienting dilemmas. Are these one and the same thing? Is feeling overwhelmed part of the learning process explained by transformation theory? If this is the case then feeling overwhelmed should enable learning. In my experience the reported feelings of being overwhelmed rob the student of the ability to learn, if only temporarily. With these feelings, the student reports loss of confidence and courage. Getting the student back on track requires proof of ability and evidence of past and therefore probable future success.

More likely the disorienting dilemma that Mezirow describes is one which arises when

the student's meaning perspective no longer makes sense in light of a new-found discovery. An internal dilemma is caused. Resolution of this dilemma promotes change and learning. This process is necessary to allow us to shift our vision and continue to expand our views. This revelation has been called an "ah ha."

On the other hand, when too many newly discovered beliefs or ideas flood the student's meaning perspective, the learning process becomes blocked. This may happen in the initial stages of the practicum. Rather than opening new vistas, the student is blinded and may be internally screaming "oh no!"

This latter situation may stem from a lack of understanding on the part of the students regarding their role in the practicum. Floods of newly discovered beliefs and concepts in the initial days of the practicum may indicate inadequate preparation of the student prior to the practicum. Students who are prepared for change in the practicum have identified and correctly anticipated their required actions in the practicum. Others have not considered the actions that will be expected of them in the practicum. Adequate student preparation would allow a forum for an exploration of expected actions in the practicum.

### Answers

Returning to the early stages of the research project and the questions I had then, it is interesting to see how my understanding has shifted. What did I learn about these questions? What answers now satisfy me? New questions have undoubtedly arisen. How do I now proceed? In this section I will restate these initial questions and offer my current response to them.

What are the students needs in the practicum? The students need to be accepted as a

legitimate part of the department. Students are people who have a purpose and a sanctioned reason for being in the hospital. This purpose is as important as the workload, in fact, it is part of the workload.

How can the practicum best serve the students' needs? The x-ray examinations that the students need to practice are available in the practicum. These are chest, abdomen, upper and lower extremity x-ray examinations. What may not always be available is the opportunity to perform the examination in a manner that promotes student learning. What is this manner? This manner is allowing the student the freedom to use his or her learned skills to do the case. How will the technologist know what skills the student possesses? The student must tell the technologist prior to the case. By promoting her or his own interests and convincing the technologist about capabilities, the student is acting autonomously. The technologist must also assume responsibility for determining the student's skills prior to starting the x-ray examination. The student who waits for this to happen may wait longer than need be to practice x-ray examinations.

For example, assessment may be done Jamie's way,

I decided I would let the student do everything. It wasn't, however, the first case I had done with the student that day. The student had learned from the first case. The first case we did together. I demonstrated everything and explained what I was doing as I went along.

The problem with this method of assessment is that the first case is used only as an assessment. The student has limited access to the decision-making during the first case and then has no alternative but to copy the technologist's practice during the second case. The

opportunity for the student to build his or her own practice from theory is thwarted. Whatever routine the student has already developed must be set aside until the second case is completed so that the technologist's preferences can be performed. The student may then experience difficulty in trying to return to her or his routine after the case.

Lack of understanding of individual roles within the practicum must be considered. The practitioner's teaching role is central to the success of the practicum. Clarification of this role is plainly indicated. In the same vein, the students' responsibilities regarding communication of objectives with technologists is also key to the success of the learning experience for the student. Reiteration of the objectives by the student prior to the case will serve to remind the technologist of his or her facilitating role. The collaborative nature of this relationship is essential, however, the student must be autonomous to initiate and promote this collaboration.

How can the practicum be made better? This is a multiplex and on-going question. Just as students must acknowledge and celebrate their own achievements and continue to strive for improvement, so must the people involved in the practicum. The practicum is a dynamic situation, ever-changing and hard to define. It is defined only through the experiences of the people who interact in the practicum. To make it better, input from the very people who make up and influence the practicum is necessary. These people, the students, technologists and clinical instructor need to see their input acted upon. This can only be accomplished if the solutions derived from their input are initiated during the practicum. In other words, evaluation of the practicum needs to be formative rather than summative. When the results of the evaluation are shared with those involved in the practicum, learning and change can proceed. If the only evaluation that is conducted is a summative one then the people who define the practicum are not privy to the feedback of the evaluation – only the clinical instructor can hope to use the feedback and then only in the next practicum.

The reason why my single-issue solutions were so ineffectual in the dynamic situation of the practicum is obvious now. I was the one receiving the feedback on the practicum from the students. I was the one who was learning and implementing changes. But in a community process such as the practicum, all parties need to learn and change. It is through this change that the practicum experience is created. Accommodating to each other can only begin when the other is considered. The other can only be considered when "it's voice" is heard.

Why do students feel the practicum is so important? The practicum is important to the students because as Kelly says, "This is the first time I've done something that really matters to me." This is the chosen career of these students. So much depends on their ability to do the job and do it well. They feel that they are proving their own worth.

What do the students learn in the practicum that cannot be learned in the Institute? They learn their own worth not in book-learning but in action. Until they go to the practicum the students have only experienced simulation and laboratory application of their newly learned information. The practicum allows them to evaluate their own performance in action. Each new experience is novel and presents the student with a new problem to solve or puzzle to unravel.

Why is the practicum experience always different, always changing? Some of the multidimensional influences that affect the experiences occurring in the practicum are the number of technologists and the diversity of practices of each technologist coupled with the personality of the technologist on a particular day and in particular circumstances coupled with the stress of workload and lifestyle pressures. Added to this is the diversity of patients coupled with the multitude of diseases and injuries coupled with their state of mind, anxiety, emotion, stress, concerns, needs. On top of this, there is the variety of x-ray equipment with differing operational controls and idiosyncrasies, different film sensitivities with various development or processing requirements, together with a variety of radiographic procedures and protocols to

interpret and follow. Narif nicely captured the sense of the complexity of personalities in a team,

If you are not happy at the moment it does manifest itself in a way, but I'm not going to treat people differently because of it. Other people, technologists, patients, doctors, etc., also have their ups and downs when they are not able to meet their goals and priorities. You can't let it affect you.

When is it good enough and why is it important to strive for improvement? Students are tough on themselves and they are impatient. Narif says, "There is so much to learn -I want to know it all now, but I can't." Recognizing progress and setting even harder goals when earlier goals are met is a skill that we all need and use throughout life. Once a goal is accomplished students seem to dismiss it as if it were worth nothing. The task has become easy and so is no longer valued. Reflecting on accomplishments and acknowledgement of these accomplishments by the student and technologist or teacher serves to promote the student's self-worth and confidence in his or her ability to achieve set goals and to select important new goals.

The radiography program set the goals or objectives. To successfully complete the practicum and continue in the program the goals have to be met. This fact turned the institutional goals of the radiography program into the goals of each student. The four radiography students had taken the institutional goals as their own. Each one of them was motivated to complete the practicum objectives. Echoes from the interviews confirmed this. "It really matters in clinical because if the cases don't get done I won't be able to go any further" [in the program] and, "it's the first time we've done something for our career." To complete the program and start on their career, the students knew they had to meet the course objectives. Accepting and accomplishing these goals are the actions of an autonomous learner.



Does acting autonomously help learning? If by autonomy we mean taking action or working towards our own goals, the students all reported feeling successful when they initiated their goal of communication with the technologist. They achieved what they wanted to, they got to do the cases they needed. Had they not communicated their needs to the technologists, I believe they would eventually have got the cases they needed, it may just have taken longer. As we see, for instance in Jamie's story, the student had to wait until the technologist assessed her or his level of knowledge by doing the first case together, before being allowed the opportunity to meet his or her own objective. As the technologists were persuaded, by the increased communications by the students, of the veracity and legitimacy of the students' needs, the students found they were able to get more of the cases they needed. In this sense autonomy helped learning.

Collaboration with the technologists enabled the students to meet their objectives. The quality of this collaboration had to be determined and was guided by the autonomy of the student. If the students did not promote their own needs, the collaboration between the technologists and the students may have resulted in students learning objectives other than the ones they needed. For instance, the student may be given tasks to perform that help the technologists perform their work. These tasks may consist of developing the radiograph that the technologist has just completed, fetching the next patient for the technologist to x-ray, delivering films the technologist produced to the film reporting area, or cleaning the room when the technologist has completed the x-ray examination. While these auxiliary tasks must be learned by the student, it is the skill-building tasks of performing the radiographic examination that are crucial to the successful completion of the practicum by the student. It is these skill-building tasks that the student needs to practice.

How do students respond when they lose their independence and it is done for them?

Loss of autonomy or independence leads to frustration in some students and inhibits learning. Fsai said, "I find I hold back my questions when I don't feel comfortable with a technologist." Chi reported, "I find sometimes that I'll be getting to something and the technologist just gets there before me. Its kind of disappointing that they do it for you and I feel like saying, 'I knew that, I knew that.'" When the student is given the chance to do the case independently, it builds self-confidence. Narif says, "Having more confidence has definitely helped me meet my goals. Having the technologist have that faith in me has helped as well."

Can we, as practitioners, make the change (or learn) for them? This is obviously impossible. Learning is a process that is personal and autonomous, but it is one that is also only achievable in the company of others. Sharing information and exchanging understanding and interpretations is the way in which we, as a small society of students, practitioners and teachers come to know the truth, interpret meaning and define reality.

How can I improve my practice to promote student growth as an autonomous learner? Here is my fundamental research question. When I now consider this question, two more stem from it. How can I promote an atmosphere where the students are not intimidated by the technologists and radiologists? And, is there a way to equalize the power structure of the practicum?

The action research process served to even out the power structure somewhat because it gave the students a voice within the department. Ways of nurturing and amplifying this voice will promote a more democratic society. The action research process also served to humanize the technologists for some students. Kelly said, "I still put techs up there on a pedestal. Last week I was apprehensive of the techs but now I feel I can approach them."

What was it about the action research process that brought about these amazing accomplishments? Clearly it was the exchange of information and ideas between the

technologists and the students and also among the technologists. The insights the technologists revealed in the gathered data, about their expectations of the students, helped the students embrace this role in the practicum. Students' concerns about meeting their objectives were heard by the technologists and discussed by the technologists. The students promoted their own agenda. The technologists were convinced of the legitimacy of the objectives and devised ways of accommodating the students' needs. In short, each faction shifted somewhat and made "room" for the other.

In other words, the action research project precipitated communicative learning. The students expressed their needs and the technologists explained their expectations of the students. This is the type of learning needed in the practicum. Technical learning has been achieved at the Institute. The student needs practice applying the technical information in practice. Getting adequate practice was accomplished by explaining their needs to the technologists and attending to the technologists needs of the students.

The practicum is a small society in which individuals work as a team. Each person has goals and plans. In a radiology department these are expressed and redefined between the practitioners and members of the department on a daily basis. When the new students arrive in the department for the practicum, the usual process of expressing and communicating goals and needs is too slow. By the time the students' needs filter out into the community of the department, the practicum is nearly over. The autonomous learner promotes her or his own agenda and initiates ways to promote communicative learning. Conversely initiating ways to promote communicative learning will enhance student growth as an autonomous learner.

The exchange of information promoted by the action research process would not have been possible without autonomy on the part of the students. Acknowledging the importance of their own goals and seeking to promote these goals, brought about this exchange. The group

planning meeting legitimized the goal of promoting learning objectives. By agreeing to the goal each student accepted it as important and committed to pursuing the goal. The students who were less autonomous gained resolve and determination from the group.

### Tension between Team and Autonomy

If it were possible to exist entirely alone we could do exactly as we please. We could be entirely autonomous. Our actions would not affect anyone but ourself. However, we live in society. The action of one person impacts another. Rules, roles and relationships are developed to minimize the impact of the autonomous actions of others.

The society of a radiology department exists prior to the students' attendance for the practicum. When the student is in the practicum, the society of the radiology department changes. It now becomes the society of the practicum within the radiology department. The practicum extends the parameters of the radiology department. There is a new composition of players and participants. A new role is defined for the technologist; teacher of the student. This role is carried out in addition to the preceding role of performing radiology examinations.

It is important that the technologist adopts this new role of teacher. Should the technologist see this role as irrelevant to the overall goal of the radiology department, the student would not be able to pursue autonomous learning. The student would not be part of the team and demands made by the student would hold little significance for the technologist. However, when perceived as a legitimate part of the team, the students' autonomous demands can be voiced and negotiated. Working in concert with each other through the group goal, the students' voice was more audible which in turn increased the negotiation power of the individual student.

In the society of the practicum, many individuals have demands and needs. Society defines roles and relationships which allows some players more autonomy than others. The

students' common or multiple voice leveled the inequalities in the practicum and allowed their needs to be heard and met.

In essence, teamwork is not possible without autonomy. Autonomy is not possible without being an accepted and equal member of the team. If each person is an accepted part of the team, each voice is heard and contributes to the direction and focus of the team. Voices that are unheard or ignored are excluded from the team or indeed are not part of the team. Decisions made by the team are made without input from the excluded voices. Being autonomous in the practicum allows the students to become part of the society or team that makes up and defines the practicum. When each member of a team functions in her or his ability as a unique and autonomous member of that team, the team is healthy and vital. The team will move forward in the direction that benefits all members of the team. It is democratic. When, on the other hand, certain voices are silenced or ignored, the team becomes dysfunctional and operates as an oppressive state or an élitist movement to the benefit of only a few.

### Reflections

Reflecting on my current understanding of learning in the practicum, I am compelled to explore the implications of this understanding. How will I change or alter my teaching next term or in next year's May practicum? How will my practice change or remain the same? What do I recommend for other students, teachers and researchers?

My teaching practice will change; indeed it has changed. I view the practicum through a different lens from the one I used prior to the research. This is bound to affect my actions and direction. The research project has also changed the participating students and technologists to some extent. Other students and technologists, however, have not had the experience of the

communication exchange brought about by the research project.

Implementing an action research project for each and every practicum is hardly practical. The amount of effort required to put the data on paper is too time consuming. There are more efficient and natural ways of exchanging issues and goals among technologists and students. It is to the promotion of this exchange that I intend to direct my efforts.

The timing of this exchange is another important consideration. To begin at the beginning of the practicum is already too late. It may be more astute to arrange for appropriate exchanges at the Institute, when preparing the students for the practicum. Inviting technologists as guests during clinical orientation classes would open up the dialogue among practitioners, students and educators. Invited technologists would return to their department and share their experience with fellow practitioners.

Promotion of autonomous learning is also necessary prior to the practicum. Expecting all students to arrive at the practicum with the necessary skills to communicate her or his own goals to the practitioners is somewhat naive. The promotion of autonomous learning in class would give the student a commitment to and practice in this skill prior to the practicum. This may be accomplished in two ways; by opening up discussion of the topic of autonomous learning and by creating a deliberate democratic environment in class.

These are important ideas and suggestions for future clinical orientation classes. I, however, must look to the autonomy that I hold and consider how I can change my own practice to facilitate the processes I have identified. In what ways can I encourage communication between student and practitioner?

I can begin with my own response to students. By listening to their concerns and needs and, when in conflict with my own goals and plans, discussing and negotiating solutions with the students I will promote communicative action. This in turn will encourage further negotiation by

students with other practitioners in future interactions.

Another way in which I can advance communicative learning is by voicing issues of concern to me. By bringing these issues into the public sphere of the department I promote discussion and debate. Through discussion and debate we arrive at a common truth. As each faction shifts and adapts to other points of view we all learn.

These last two personal recommendations hold true for all teachers and indeed seem to be universally applicable to those who wish to live and learn in the company of others. Welton (1997) talks of the need to build "social capital" which is defined as the, "processes between people which establish networks, norms and social trust and facilitate co-ordination and co-operation for mutual benefit" (p. 32). Accruing social capital is tantamount to team building or the promotion of a deliberate democracy.

#### Recommendations for Further Research

The action research project, which I initiated, was never intended to reveal universal truths. Rather it was a personal endeavour to inquire into my own practice with an eye to improvement. I prefer to hold on to the initial intention because the knowledge and understanding I have developed in the process of the research far exceeds the contents of this thesis. I cannot capture on paper every glimpse of insight, every new revelation that I experienced. It is this experience that is the real reward, perhaps I should say, the real product of the research project.

With this in mind, I recommend to those with similar questions, or even those with any questions, to undergo the same process. Action research creates a forum for open debate, discussion and learning. Now that the project is complete, the skill is to maintain that forum.

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## Appendix A

## Student Interview Week # 1

I read the poem "Autobiography in Five Short Steps" by Portia Nelson,\* out loud.

I walk down the street.  
There is a deep hole in the sidewalk.  
I fall in.  
I am lost...I am helpless  
It isn't my fault.  
It takes forever to find a way out.

I walk down the same street.  
There is a deep hole in the sidewalk.  
I pretend I don't see it.  
I fall in, again.  
I can't believe I am in the same place,  
But it isn't my fault.  
It still takes a long time to get out.

I walk down the same street.  
There is a deep hole in the sidewalk.  
I see it is there.  
I still fall in, it's a habit...but,  
My eyes are open.  
I know where I am.  
It is my fault.  
I get out immediately.

I walk down the same street.  
There is a deep hole in the sidewalk.  
I walk around it.

I walk down another street.

### Interview Questions:

1. What's happened to you so far in the practicum?
2. Have your expectations been met so far?
3. What's missing?
4. What objectives have you met?
5. Is there anything that the technologists or I have done that has helped you to learn?
6. How, why?
7. Is there anything that you have deliberately done that has helped you learn?
8. What are you looking forward to next week?

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\* Source and date unknown.

## Student Interview # 2

I ask the student to read aloud a list of affirmative statements. The purpose of this exercise is to acknowledge that the statements are true for each student. It also gives the student a list of positive statements that he or she may be able to use to replace the negative self-talk that the student may be practising.

1. I am a valuable and important person and am worthy of the respect of others.
2. I'm optimistic about life; I look forward to and enjoy new challenges to my awareness.
3. I am my own expert and I allow others the same privilege.
4. I express my ideas easily and I know others respect my point of view.
5. I am aware of my value system and am confident of the decisions I make based on my current awareness.
6. I have a positive expectancy of reaching my goals and I bounce back quickly from temporary setbacks.
7. I have pride in my past performance and a positive expectancy of the future.
8. I accept compliments easily and share my successes with others that have contributed to them.
9. I feel warm and loving towards myself for I am a unique and precious being, ever doing the best my awareness permits, ever growing in wisdom and love.
10. I am actively in charge of my life and direct it in constructive channels. My primary responsibility is for my own growth and well being (the better I feel about myself, the more willing and able I am to help others).
11. I am my own authority (and am not affected by negative opinions or attitudes in others).
12. It is not what happens to me, but how I handle it, that determines my emotional well being.
13. I'm a success to the degree that I feel warm and loving towards myself.
14. No one in the entire world is more or less worthy, more or less important than me.
15. I count my blessings and rejoice in my growing awareness.
16. I am an action person; I do things first and one thing at a time.
17. I am warm and friendly toward all I contact; I treat everyone with consideration and respect.
18. I am kind, compassionate and gentle with myself.

This procedure is not a new one. You have been affirming all your life and you will continue to do so for the rest of your life. By deliberately controlling the input of information it's possible to direct the changes we intend to make to our performance.

### Interview Questions:

1. What's happened to you lately in the practicum?
2. Did you imagine this would happen?
3. Have you made any progress? How?
4. What helped you make this progress?
5. What worries or concerns you?
6. What do you hope to happen next week?
7. How are you implementing the plan? Is it working?



### Student Interview # 3

Together we work through the "Accessing your Strengths" sheet.

#### ACCESSING YOUR STRENGTHS

Most of us grow from our strengths, but do we know what they are?

After you fill in the information below, you will make one affirmative statement about yourself, short and simple. It should not have any qualifiers such as "sometimes", "only", "but", etc.

##### Skills

I'm really good at \_\_\_\_\_

##### Attitude

People tell me I could be describes as especially

e.g. energetic, positive, etc \_\_\_\_\_

##### Knowledge

I know quite a bit about \_\_\_\_\_

##### Satisfaction

I get a great deal of fulfilment from \_\_\_\_\_

##### Values

I feel it is important that \_\_\_\_\_

##### Motivation

I am really keen about \_\_\_\_\_

e.g. being \_\_\_\_\_ doing \_\_\_\_\_ learning \_\_\_\_\_

##### Affirmative Statement:

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##### Interview Questions:

1. What's happened to you lately in the practicum?
2. What's your latest conquest?
3. How did you get help with this?
4. What worries or concerns you?
5. How did you incorporate the plan this week?
6. Did it help or what?
7. Next week is the last week.

## Student Interview # 4

I explain the "Success Analysis" form and ask the student to complete it on his or her own.

SUCCESS ANALYSIS	
	List Successes
	Reason Why
Family or Personal	1 _____
	2 _____
	3 _____
Social Skills	1 _____
	2 _____
	3 _____
Hospital or BCIT	1 _____
	2 _____
	3 _____
Most successful experience _____	
Two anticipated successes in the next few weeks _____	
_____	
A successful experience for me involves: _____	
_____	

### Interview Questions:

1. Where are you at now in the practicum, what's happened lately?
2. What has helped you meet your objectives?
3. What has hindered your progress?
4. How has the research project affected you?
5. What does autonomy mean to you?
6. What do you think the research project means?
7. What are your plans for the summer?

## Appendix B

## Technologist Interview

1. Tell me what happened when you worked with the student.
2. What is your idea of a good student?
3. What do you think helps or hinders student learning here?
4. What would help student learning?
5. What qualities should an x-ray technologist have?
6. What factors make up the patient/technologist relationship? (What's important when a technologist is working with a patient?)
7. How much are you able to practice radiography to the best of your ability?
8. What's your idea of a good technologist?
9. Is there anything else you would like to say?

## Guided Questions for Technologists and Students

Please consider the following questions when you read the research data.

- Is there any idea in the writing that you particularly relate to or with which you disagree?
- Have you ever had a similar experience to the one described or has the opposite been your experience?
- Is there something missing from the writing in your opinion or is there something you want to add?
- Can you encapsulate the main thought in the writing in 2-3 words?