# The Integration of Educational Technology in the Elementary Years Curriculum:

## A Qualitative Case Study in the Fort Garry School Division

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# THE INTEGRATION OF EDUCATIONAL TECHNOLOGY IN THE ELEMENTARY YEARS CURRICULUM: A QUALITATIVE CASE STUDY IN THE FORT GARRY SCHOOL DIVISION

BY

PATRICK DAVID BENSON

A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of Manitoba in partial fulfillment of the requirement of the degree

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# Abstract

This qualitative case study focuses on the integration of educational technology in the elementary curriculum of the Fort Garry School Division #5, in Winnipeg, Manitoba, Canada. The research population included eight teachers from eight different schools. Long answer interviews were conducted during the winter of 2001 seeking information on three research questions:

1. How do the educational technology leaders in the elementary years define educational technology?
2. What are some of the significant stories/experiences that technology leaders talk about: a) when they first started integrating technology into their teaching; b) and, how they are integrating technology now?
3. What issues, concerns and recommendations have the educational technology leaders identified as critical to the integration of educational technology in the elementary years?

The data collection process used followed a Belland (1991) Eisner (1991) connoisseurship model. The educational technology leaders' stories revealed that educational technology was being effectively implemented in the technology leaders' classrooms. Their stories focused on two points: 1) information technology hardware, and 2) the integration of technology into the existing curriculum. From these points eight recommendations were gleaned. They are that:

1. The Fort Garry School Division create a committee to review the issues raised in this study.
2. A technology forum be created that will allow interested teachers the opportunity to meet and discuss the art/science of teaching with technology.
3. A hardware and software review be conducted to determine the real needs of each of the individual schools.
4. The current Divisional plan that supports the staff purchase of educational technologies for personal use be expanded.
5. Schools review the on-going integration of educational technology in their school plans.

6. The Division implement a strategy to introduce *Technology as a Foundation Skill* (1998) and takes a leadership role in introducing the new web based resource, *Curriculum Navigator* (2001).
7. Substitute teacher release time is provided to permit a collegial mentor program to be implemented.
8. Funds are made available to groups and or individuals interested in pursing technology based research projects.

The technology leaders identified many postmodern-like qualities that should be considered when devising a new educational technology plan. These qualities include accepting a constructivist approach to teaching and learning, a willingness to adopt an open style curriculum described by Doll (1993, 1993a), and an awareness of the six postmodern conditions described by Hlynka (1995).

## Acknowledgements

Designing, conducting and reporting a study such as the one described in this thesis is only possible with significant support from family, friends, and colleagues. Kurt Vonnegut (1972) in his novel, *Cat's Cradle* names this group my "karass" (p.1). I wish to express my sincere appreciation to all those who provided the encouragement and guidance that allowed me to complete this undertaking.

First, I wish to thank my committee, Dr. Denis Hlynka, Dr. Dave Mandzuk, and in particular my advisor, Dr. James Welsh, for the guidance and direction that made this thesis a reality.

Second, I wish to thank Mr. Jean Beaumont, Superintendent of Fort Garry School Division, for his educational leadership, and his modeling of the credence that, life long learning is not an option. I also wish to acknowledge the assistance of the Fort Garry School Division in allowing me to take a sabbatical leave during the 1999-2000 school year. Finally, thanks to Mr. John Howden for his wisdom in establishing the technology partnership with the University of Manitoba.

Third, I wish to thank my fellow colleagues, the educational technology leaders in their individual schools, the teachers who agreed to meet with me, and discus their dreams and aspirations in educational technology. In particular, Elaine Egan who started me on this journey, provided encouragement, and read my first drafts.

Finally, thanks to my family. To the Bonzo Boys, James, Thomas, Jon and Paul, may this project serve as an example that even their "ole Dad" can still learn from and contribute to the public school system that has provided them with an education. Finally my wife Maureen, as she watched another one of her boys go off to classes, for the help you provided transcribing the long interviews, especially your anecdotal notes.

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# Chapter 1

# Introduction

## Background

The integration of technology into the elementary years curriculum has become a critical issue in education and one that has generated a great deal of discussion among parents, teachers and school administration (see Backhouse, 1997; Carlson, 1997, Charp, 1996; Gates, 1996; Guerard, 2000; Inkster, 1998). The issue has also been identified in my own district through a report titled, *Integration of Information Technologies in Fort Garry School Division* (2000). That report summarizes the efforts of a partnership initiative that began in 1999 with the Fort Garry School Division and the University of Manitoba, Faculty of Education. This thesis is a case study that focuses on the integration of educational technology in the elementary curriculum in the Fort Garry School Division #5, Winnipeg, Manitoba, Canada.

This partnership began as a study group, comprised of Mr. John Howden, the Director of Administrative Services in the Fort Garry School Division and Drs. James Welsh and Denis Hlynka from the Department of Curriculum, Teaching and Learning at the University of Manitoba. In addition to these three primary researchers, the group included teachers (Dave Benson, Elaine Egan, and Leona Wiens) involved in Graduate Studies and Post Baccalaureate work in the Faculty of Education.

As noted in the report, the initial review was held on at least two distinct levels, the research literature, and the policy documentation. In regards to policy, they reviewed

three documents: 1) the Provincial directive, *Technology as a Foundation Skill*, 2) the *Fort Garry School Division Three Year Information Technology Plan*, and 3) the Fort Garry School Division's Mission Vision statements related to technology. The literature review focused on a broad range of topics; however, it was directed by four guiding questions posed by the Fort Garry School Division's senior administration:

1. How is the Fort Garry School Division using technology in teaching/learning?
2. What is the Division doing right?
3. What is the Division doing that it should not be doing?
4. What is the Division not doing that it should be doing?

The Hlynka, Welsh, and Howden (2000) report was presented to the Divisional Technology Advisory Group in the fall of 2000. It made several recommendations; two of which became the focal points for my thesis:

1. Fort Garry School Division should develop 'snapshots' of current and best practices of technology integration within the division.
2. A "connoisseurship" model based on the theories of Elliot Eisner and John Belland should become one of the research strands for further development (pp. 11-12).

The Fort Garry School Division (FGSD) is a suburban, public school district. There are thirteen schools that provide elementary programs of instruction. Of these thirteen, eight schools offer kindergarten to Grade six, two are kindergarten to Grade four, two schools are Grade five to nine and one encompasses kindergarten to Grade nine. A further demographic breakdown of these thirteen schools, show three French immersion schools, one each of K-6, K-4 and Grade 5-9. In this study I do not intend to differentiate between languages of instruction.

There are three interrelated concepts that serve as a focus for this study: 1) curriculum, 2) integration, and 3) technology. Manitoba Education and Training (MET)

has addressed curriculum in the *Renewing Education: New Directions* (1995, 1994) series and the developments in technology with *Technology as a Foundation Skill Area: A Journey Toward Information Technology Literacy* (1998). These directives suggest that technology should be integrated into the provincial curriculum. MET says that, "To be most effective, the acquisition of these new skills will be achieved through a curriculum-integrated approach that uses information technology to support teaching, learning and assessment" (Manitoba Education & Training, 1998, p.7); hence, my decision to combine the concepts. My thesis will address educational technology and curriculum integration in the elementary school.

**The Research Questions**

The study is based on three questions. The formation of these questions is based upon ideas presented by Ralph Mason of the University of Manitoba in a graduate course entitled, "The Study of Teaching". We discussed the importance of being able:

- to recognize excellence in teaching
- to describe what we see, hear and sense
- to cause more excellence in teaching to happen.

(from the course outline 1999)

These ideas can be applied to the teaching with technology in the elementary years. It is my wish is to be able to recognize excellence in teaching with technology. The recognition of excellence in teaching is part and parcel of my research method. The method is an Eisner-Belland model of evaluation termed "connoisseurship" (Eisner, 1991, p.63). Connoisseurship will be defined later and the process described at length in Chapter 3.

The three research questions that evolved from the three ideas from "The Study of Teaching" are:

4. How do the educational technology leaders in the elementary years define educational technology?
5. What are some of the significant stories/experiences that technology leaders talk about: a) when they first started integrating technology into their teaching; b) and, how they are integrating technology now?
6. What issues, concerns and recommendations have the educational technology leaders identified as critical to the integration of educational technology in the elementary years?

**Definition of Terms**

The Association for Educational Communications and Technology (AECT) defines **educational/instructional technology** as "... the theory and practice of design, development, utilization, management and evaluation of processes and resources for learning" (Plomp & Ely, 1996, p.18). It is important to note the interchangeability of terms here. The terms "educational technology" and "instructional technology" are often considered to be equivalent. Hlynka and Belland (1991) clarify a common perception that technology is more than just tools when they state that, "technology does not merely represent a set of devices that teachers may choose to use, but more importantly advances a world-view that shapes social existence" (p.17).

In recent years, the term technology has taken on many meanings and is perhaps misunderstood. It is for this very reason that one of my first questions to participants is designed to elicit their understanding of educational technology. The *Technology as a Foundation Skill* (1998) document also addresses this concern. It attempts to clarify the term by limiting the colloquial definition to mean technology as information technology.

"The use of the term information technology has been increasing amongst educators to avoid confusion with the wider, all-encompassing historical definition of technology" (p.1). Allan November also makes this distinction when he suggests we, "get rid of the T-word. Focus on information and communication" (1999a, p.2). Consequently my thesis will now consider the three terms, educational, instructional and information technology to be synonymous.

Another critical term is **qualitative**, as it applies to aspects of research methodology. McCracken (1988) says that, "The (qualitative) interview gives us the opportunity to step into the mind of another person, to see and experience the world as they do themselves" (p.9). Eisner (1991) prefers to call the field qualitative inquiry. He says, "... qualitative thought is ubiquitous in human affairs. It is not some exotic form of doing or making, but a pervasive aspect of daily life" (p.5). Creswell (1994), in reviewing Eisner, identified six assumptions about qualitative inquiry:

1. Qualitative researchers are concerned with process...
2. Qualitative researchers are interested in meaning ...
3. The qualitative researcher is the primary instrument...
4. Qualitative research involves fieldwork...
5. Qualitative research is descriptive...
6. The process of qualitative research is inductive... (p.145).

The research suggests that there is criticism of the qualitative method (Bresler, 1994; Creswell, 1994; Frankel and Devers, 2000; Gibson, 1981; McCracken, 1988). Within the basic term, qualitative inquiry, there are a number of complex concepts. Qualitative inquiry may be considered a social science or even an art, and perhaps this complexity invites concern from traditional researchers. At one extreme, Rex Gibson (1981) denounces the method totally. He says there is "a delusion abroad; a delusion that

has already mislead some researchers in education. ... I believe its theory and practice to be deeply flawed" (p. 485). On the other hand others support the method but with some cautions. Bresler (1994) talks about the need for "understanding of the assumptions, methods, and contributions of these genres..."(p.1) and then provides clarification of these terms. McCracken (1988) says, "There are several areas of controversy within qualitative research methodology" (p.11). He then provides guidelines to help avoid mistakes that could lead to weak research and thus reduce or eliminate the controversy. Hlynka and Belland (1991) argue that there are at least three research paradigms: 1) quantitative, 2) qualitative, and 3) the "critical" paradigm. They say, "... this third paradigm focuses on the criticism in the sense of art and literary criticisms within the humanities" (p.6). Keeping these criticisms in mind, a clear definition of qualitative research requires an understanding of the specific genre known as educational criticism or connoisseurship.

**Connoisseurship** is grounded in Eisner (1991) and Belland's (1991) recent works. Connoisseurship has Latin origins and can be recognized in French as, connâitre, the verb "to know." In the French language there are two verbs that describe, "to know" and this one means, "to know intimately". This is the sense that I would encourage the reader to keep in mind. Eisner defines connoisseurship as, "The ability to make fine grained discriminations among complex and subtle qualities... Connoisseurship is the art of appreciation" (1991, p. 63). Belland coins connoisseurship as "the sophisticated internal preparation an individual brings to her/his experience of anything... a great systematic reservoir of knowledge" (Hlynka, Belland, 1991, p.23). Sharma (1998)

describes in his own terms the Eisner-Belland definition as one of *The 8 Rituals of Visionary Leaders*. He says, "See what all see, think what none think" (p.231). I believe that all individuals have the ability to be a connoisseur in a field; however, we are not all connoisseurs in every aspect of life or education. The teachers interviewed will likely all have areas of connoisseurship and some may even be connoisseurs in the field of educational technology; however, the term connoisseur in this thesis is used to describe my role as the researcher. I accept this role with a sense of humility and aspire to avoid the "narcissism" suggested by Gibson (1981).

Belland (1991) and Eisner (1991) say that connoisseurship suggests **educational criticism**; however, criticism should not always be perceived as negative. In the realm of art appreciation, the art critic does not always make disparaging comments about a piece of art. It is a process that is exemplified by the title of Eisner's 1991 book, *The Enlightened Eye*. The criticism can and should reveal the mastery of the work, and in this application, the quality of the integration of technology in the curriculum. "Its aim is to illuminate a situation or object so that it can be seen or appreciated" (Eisner, 1991, p.7). Criticism falls within Hlynka & Belland's (1991) third paradigm and is grouped with the postmodern condition. The link to the postmodern condition will be developed in Chapter Two. According to Belsey (1980), "the object of the critic is, to seek not the unity of the work, but the multiplicity and the diversity of its possible meanings, its incompleteness, the omissions which it displays but cannot describe, and above all its contradictions" (p. 109).

**Rationale**

What would one expect to see with respect to technology if one were to visit one of the thirteen elementary schools in the Fort Garry School Division? I would suggest that there would be some commonalities as well as some specific school-based initiatives. The Division has focused on technology for almost twenty years. This focus has evolved from Apple computers in the elementary schools during the 1980's to IBM units with a Window'95/98 platform. The schools have gone from individual machines in the classroom, to network labs, and now to various combinations of the two.

Newspapers, journals and magazines provide us with constant updates on the status of technology in the schools around the world. Some of these are very positive, such as this report in *The Globe and Mail*, September 11, 2001: "Canadians at forefront of Web use in schools. Canada is near the top of the class globally when it comes to offering Internet access to its students. And Canadian students are increasingly dependent on the Internet for the kind of research that sent older generations scrambling to dusty library stacks or thumbing through encyclopedias." However, not all reports cast a favourable light on the topic. For instance, this article appeared in the *Montreal Gazette* on September 18, 2000:

> Quebec is forging ahead with its new-technology school curriculum. More Quebec classrooms than ever have computers this fall... experts are asserting that for the youngest students, computers can actually impede development. The claim, in a study done by a Washington-based group called the Alliance for Childhood, raises disturbing questions at a time when Quebec schools are starting the shift to a new curriculum - one that puts more emphasis than ever on technology, even in the youngest grades.

In Canada's weekly newsmagazine, *McLean's*, Ann Johnston cautions, "Beware the techno-gods"! She goes on to suggest that when it comes to technology, there are two distinct camps, "...those who worship at the altar of technology, and those who don't." In her article published in the October 25, 1999 issue, she says, "56 per cent of Canadians think that there is too much emphasis being put on computers in schools." The *eSchool News*, from the United States, recently published the Trends Report 2000. The Software and Information Industry Association funded this report, and it suggested, "The perception of education technology will change dramatically in the next 12 months in the eyes of the supporters and skeptics alike" (Guerard, 2000, p.4). These four articles do offer a **criticism** of educational technology in public schools. Some of that criticism is positive and some negative. My thesis will look closely at these criticisms in the area of the elementary classroom and curriculum integration.

**Limitation and Delimitation**

This study is limited in one major way, limitation being a factor that I am unable to control. It is qualitative. My study is based on a small, select sample of participants in the Fort Garry School Division. It provides a snap shot of what educational technology leaders in one suburban school division in Winnipeg, Manitoba, Canada believe are best practices with respect the integration of educational technology in their elementary schools. There may be similarities and parallels with other schools in Manitoba, and perhaps in many other jurisdictions; however, this study is limited by definition and the qualitative method to the K-6 schools in the Fort Garry School Division.

This study is also delimited, meaning the limitations are within my control. "Research is not value free" (Hlynka, Welsh, Howden, 2000, p.3). The inherent values, biases and beliefs of the author also restrict the ability to extrapolate the findings. In qualitative research, "...researchers are part of the reality of the study, they can never be neutral" (Bresler, 1994, p.2). In the case of a qualitative study, my beliefs may be perceived as a delimitation. As the researcher, I believe:

- Educational technology and its synonymous terms have become integral to the teaching/learning process.
- We must assess critically new technologies, to insure they add value and substance to the task at hand.
- Providing hardware, connecting schools and supplying the Internet is not enough.
- The "constructivist" theory of truth and learning is an assumption in this study.
- The postmodern condition has a strong influence on the educational curriculum.
- Autobiography is a valid form of research and contributes to the qualitative model.

These beliefs may surface as biases in my analysis and interpretation of the data collected.

**Overview of the Study**

Chapter One has presented the research problem, explained the background, defined terms, and provided a rationale for the study. Chapter Two will review the related literature, Chapter Three will discuss the methodology, and Chapter Four will describe the findings from the long interviews. Chapter Five will discuss the findings in relation to the research questions, and Chapter Six will make recommendations for the Fort Garry School Division.

**A Note on "Voice"**

I wish to make clear from the onset that my writing style may be different from that of a traditional thesis. I will rely heavily on the first person singular in writing this thesis. This is a conscious decision based upon the writings of Eisner, (1991) Graham, (1992) and Keen (1970) and it is consistent with the qualitative approach and the connoisseurship model. Sam Keen's book, *To a Dancing God* has influenced me, and my writing style, he says, "The voice that speaks to you in these essays is mine. The conclusions I reach are not inescapable. Both my doubts and my certainties may be too intimately connected to unique elements in my autobiography" (p.2).

Eisner (1991) also speaks of voice; "I have tried in this book, as in all my writing, to keep a voice in the present. I want readers to know that this author is a human being and not some disembodied abstraction who is depersonalized through linguistic conventions that hide his signature. This approach is more honest. Hence I make no apology for the personal tone...I want that to show" (p.4). The "I" speaks of an autobiographical style that Roy Graham (1992) discusses when he argues for a style of research through autobiography. My thesis is not an autobiography; however, Graham (1992) does reflect one of my stated biases:

> I want to explore the proposition that to talk at all about knowledge and the curriculum is inevitably to talk about the self and the manner in which the self makes the flux of the experience intelligible. ... For if all knowledge begins in self-knowledge, or is a function of self-knowledge, then we cannot be said to truly know something until we have possessed it, made it our own (p.3).

**Chapter Summary**

This chapter has identified the need for my research project. The Fort Garry School Division, in Winnipeg, Manitoba, Canada has invested considerable resources into the field of educational technology and to date, little has been done to substantiate the value of the investment. I have identified the rationale for the project and linked this thesis to recommendations of a study group. All research is limited in its scope and all research contains biases. I have identified those biases, as I perceive them, so that readers may be informed of my beliefs and see my analysis from my prescribed position. The scope and limitation of the study are further clarified by the definition of key terms, such as educational technology, the qualitative paradigm, and connoisseurship.

# Chapter 2

# Review of the Literature

## Introduction

A literature review is normally conducted prior to conducting a research project. However, when using a qualitative approach, some researchers suggest that the literature review need not be conducted until after the fieldwork is complete (see Bresler, 1994; Creswell, 1994; Frankel and Devers, 2000; McCracken, 1988). They rationalize that with this approach the investigator will remain open to the participants' beliefs and ideas and will not be directed by outside influences or predetermined findings. In acknowledgment of this concept, the literature review component of this study will continue during the interview process.

I have identified key concepts that require examination in the literature review. The concepts that I will develop are the:

- Elementary years
- Post-Modern Curriculum
- Provincial Curriculum
- Process of integration
- Change process

## The Elementary Years

The term 'elementary years' is undergoing a subtle change. The Merriam Webster dictionary defines it as: "relating to an elementary school, an elementary curriculum." Upon looking deeper, we discover a traditional definition dating back over

160 years, an elementary school is described as: "a school including usually the first four to the first eight grades and often a kindergarten." A search of the Manitoba Education and Training (MET) website did not yield a definition, but by assessing the grade level support structures, MET suggests and follows the trend described in this paragraph. Consultants and provincial projects, such as Curriculum Information and Technology Integration (CITI), are defined as K-S4, with sub membership identified as K-4, 5-8 and S1-S4. The K-4 is elementary as described above by dictionary definition. In Winnipeg, Manitoba, Canada, where this research project is being conducted, that is referred to as "early years". The Fort Garry School Division has two schools functioning by that definition. The 5-8 group is commonly referred to as "middle years", and although there are two schools that come close to that standard, they also include S1 as part of their school population. These middle schools have, by dictionary definition, an elementary component. Ideally, teacher participants in my study from those two schools will be nominated from the Grade 5 or 6 staff. The remaining nine schools include the generally accepted description of elementary and include at least a continuum of Kindergarten - Grade 6.

What makes elementary schools unique in the public school system? Perhaps the most obvious feature is that of the teacher's role in the classroom. For the most part, students in the K-6 grades have one teacher for all their core subject areas, and in some cases, a specialist for Physical Education, French, and Music. This is the case in the Fort Gary School Division. The exceptions to the rule may include teacher job sharing arrangements and multi-age programs where children may have two teachers plus

specialists. The "one teacher" concept is important when we look at curriculum integration. With just the one teacher it is easier and simpler to create the seamless process of instruction. The classroom timetable does not have to be interrupted every thirty minutes to begin a new subject or to change subject teachers, as is the case in secondary institutions. It becomes easier to integrate when the teacher is able to make time adjustments in the daily schedule to facilitate integration of subject areas.

**Post Modern Curriculum**

Educators have been exposed to a wide range of topics, many of those pointing toward new ways of thinking about and looking at curriculum. This analysis of paradigms has seldom given specific answers on exactly what curriculum is or does, so let us first begin by looking at a definition of curriculum. The Merriam Webster dictionary says it is, " 1: the courses offered by an educational institution. 2: a set of courses constituting an area of specialization. In our public school system, I would suggest the second definition is the most widely accepted, and becomes more specific when you exchange the noun "courses" with words that describe the core subjects: English Language Arts, Mathematics, Social Studies and Science. In Manitoba, an examination of the provincial document, *A Foundation For Excellence* (1995) provides a broader definition of curriculum. In reference to its four foundation skills, the Department says, "Every teacher will be a teacher of literacy and communication, of problem solving, human relations and technology" (p.17).

I wish to suggest that the Manitoba curriculum is represented at two levels. The first level is a study of contemporary courses/subjects in Language Arts, Mathematics,

Science and Social Studies. This I would suggest is the first level. It is representative of the Ralph Tyler (1950) rationale, or modernist curriculum. The Tyler rationale is described by four key questions:

1. What educational purposes should the school seek to attain?
2. What educational experiences can be provided that are likely to attain these purposes?
3. How can these educational experiences be effectively organized?
4. How can we determine whether these purposes are being attained? (p1)

I would then suggest the second level is the set of four foundation skills. They are identified as literacy and communication, problem solving, human relations, and technology. This is the more complex theoretical level of beliefs, mission and vision. I would further like to suggest this is representative of the William Doll (1993) **post-modern** curriculum design. Doll suggests that curriculum (currere) has a verb sense too, and that verb sense carries the significance of making meaning from the course, not just the noun sense, not just receiving information.

In recent years, we have heard parents say that it is time to return to the three R's, by getting back to the basics in curriculum and instruction: reading, 'riting and 'rithmetic. Unfortunately, this does not include a specific reference to technology. In our new world of education, a post-modern thinker like William Doll (1993) might extend the three to four new R's to include, rich, recursive, relational and rigorous. This does offer the possibility of technology integration. The school level administration and classroom practitioner must keep all of the above in mind. They are also burdened by the anxiety of documents with topics that must be completed and understood by all of their students. New curriculum documents from the Department speak of general outcomes leading to

specific outcomes matched to grade level standards. This style of curriculum requires regimentation, standardization, and I would suggest, based on my own personal observation and experience, stifles the creative spirit and intuition of many teachers. On the other hand, teachers are learning to adjust their teaching styles and strategies. This has lead to an appreciation of a new style of curriculum, described by some as, post-modern (Doll, 1993; Doll, 1993a; Hlynka, 1995).

Denis Hlynka identifies six features of a postmodern condition: **breakup of the canon, multiple voicing, non-linearity, ironic juxtaposition, supplement, and slippery signifieds** (Hlynka, 1995, pp.114-117). These terms will be described in greater detail, and I will weave into these post-modern concepts the curriculum/technology statements.

Traditional models of curriculum implementation can be supplemented, enhanced, or indeed replaced, by new paradigms that support exciting new developments in education. John Belland (1991) suggests that the concept of connoisseurship is a form of curriculum criticism and development. The connoisseur is often linked to literary criticism, art, or other forms of artistic expression. The connoisseur exemplifies the wisdom that goes beyond mere subject knowledge. Belland says, "The connoisseur can be relied upon to absorb a great deal of information about her/his experiences" (p.22). The art of connoisseurship is something that I would like to connect with teacher intuition, and eventually curriculum integration. The connoisseur, as an observer, never ceases the journey of learning. "While he/she may have seen similar things before, each

creative work (in this context, a work is most often an instructional system) has unique nuances" (Hlynka & Belland, 1991, p.32). I believe that seeing the subject matter curriculum is one level; however, bringing the artistic expression and connoisseurship through integration of a 'foundation skill' is a higher level.

The 'nuances' described above by Hlynka and Belland are also reflected in Freeman Patterson's (1979) work. Patterson is a professional Canadian photographer, best known for elevating the work of the shutterbug to that of an art form. This is evident through his many books including *Photography: The Art of Seeing.* There is not a more appropriate corroborative comment for Belland's connoisseurship than from a field that itself has had difficulty being recognized as an "art" form. Patterson talks about "thinking sideways".

> "When you think sideways you will find new ways to see your subject matter, and you will stumble upon discoveries and happy accidents. Abandon your normal premises, and go in search for new ones. Instead of only trying to improve your present photographic approaches and techniques, consider approaches and techniques you've never tried.
> ...A good way to break the grip of an idea that controls the way you see and photograph is to pretend that it doesn't exist. You must break the rules" (pp. 28-29).

The artist is able to intentionally break the rules to create a masterpiece, to go beyond an outcome or exceed an expectation. From a post-modern perspective, the intentional breaking of the rules or the creation of brand new rules is termed, **break up of the canon**.

Overly and Spalding (1993) certainly establish new rules, or **break up of the canon** in their article, *The Novel As A Metaphor For Curriculum And Tool For Curriculum Development.* In this article they suggest, "Novels invite fresh interpretations of new and old experiences. They are unpredictable, exciting, multilayered creations, giving their readers diverse images and new understanding. These qualities lead the authors to wonder why departmental curriculum could not serve the same function. They state, "Good curricula should have the same effect"(p.1). In a postmodern world of breaking up the canon, the performing arts and the recorded arts provide mediums for the presentation of diverse images and new subtle meanings. The work of a skillful actor, the engaging voice of a narrator, the lyrics in a song all help to enhance and broaden the understanding of a concept. These genres are presented in the classroom through the integration of educational technology.

Marshall McLuhan (1967) opened up the possibilities in his *Medium is the Massage.* In the days of the three R's, the teacher was the classroom and the curriculum. Today through developments in educational technology "we now live in a global village" (McLuhan, 1967, p.63), a village that extends far beyond the traditional classroom walls to the village classrooms in every corner of the earth. What better way to reach out to the others in the 'village' than through the technology of the Internet? The one voice of the teacher has been supplemented by the skillful use of many voices and mediums by the teacher facilitator in the classroom. As McLuhan (1967) suggests, "now all the world's a sage." (p.14) Recently, my own son was reading "Hamlet". He elected a unique method of study, a new canon. He began by reading the play in a textbook. This was enhanced

and enriched by viewing a 1996 video copy of a film based on the same book. The video in fact was set in a modern era with classical Shakespearian speech. In other words, he was studying the original play by utilizing modern technology to see and hear the story from different perspectives.

If **multiple voices,** suggested by the preceding anecdote, mean presenting the "same" in a different light, we can look at George Reavis' (1996) curriculum in the animal school system. Here the multiple voices criticize our current documentation that asks all students to do the same sort of tasks, regardless of the mental and or physical abilities they possess. The good news here is that the works of Howard Gardner, (1993) in the area of "multiple intelligences", has had a positive affect on jurisdictions like Manitoba where we recognize learning styles and have attempted to address some of those issues in the document *Success For All Learners* (1996).

### The Animal School

Once upon a time, the animals decided they must do something heroic to meet the problems of "a new world." So they organized a school.

They adopted an activity curriculum consisting of running, climbing, swimming and flying. To make it easier to administer the curriculum, all the animals took all the subjects.

The duck was excellent in swimming, in fact better than his instructor, but he made only passing grades in flying and was very poor in running. Since he was slow in running, he had to stay after school and also drop swimming in order to practice running. This was kept up until his webbed feet were badly worn and he was only average in swimming. But average was acceptable in school, so nobody worried about that except the duck.

The rabbit started at the top of the class in running, but had a nervous breakdown because of so much make-up work in swimming.

The squirrel was excellent in climbing until he developed frustration in the flying class where his teacher made him start from the ground up instead of from the treetop down. He also developed a "charlie horse" from overexertion and then got a C in climbing and a D in running.

The eagle was a problem child and was disciplined severely. In the climbing class he beat all the others to the top of the tree, but insisted on using his own way to get there.

At the end of the year, an abnormal eel that could swim exceedingly well, and also run, climb and fly a little, had the highest average and was valedictorian.

The prairie dogs stayed out of school and fought the tax levy because the administration would not add digging and burrowing to the curriculum. They apprenticed their children to a badger and later joined the groundhogs and gophers to start a successful private school.

Does this fable have a moral?

*George H. Reavis*

(Reavis, 1996, pp.121-122)

Multiple voices allow for many ideas to be shared, where all ideas carry credence. No one solution is best, but rather they all carry an inherent value or significance. Educational technology provides another way of presenting information, providing a vehicle for student learning. In their article, *Authentic Educational Technology,* Estes and Clark (1999) discuss this point, especially in relation to the ongoing friction between the scientific world and the social sciences. When people say things like science is out of touch with the practical world or that scientists are disdainful of practitioners in the classroom, they close the doors to open discussion and analysis of curriculum. Their suggestion of a postmodern model for education is based on the idea, that "as long as researchers, technologists, artists, and practitioners share a compatible definition of science, a willingness to solve practical problems, and a commitment to having ideas disconfirmed, then fruitful collaboration is possible" (p.11).

One of those multiple voices in curriculum is mine. Not just me, but the me/mine in each educator Robert Graham (1992) writes about autobiography in curriculum. He makes a clear case for the story of self based on the accepted works of noted educational philosopher John Dewey. In his book, Graham argues for acceptance of the critical criticism that arrives through autobiography and self-reflection as a valid form for curriculum. Graham spends time developing the idea of truth. He says that even in autobiography, the truth presented is the truth as understood by the author and may not be real truth or truth to all readers. The autobiographical truth is biased and is influenced by the race, culture, era, and life experiences of the writer.

Some of these truths are based on intuition. The Merriam Webster dictionary defines intuition as: "quick and ready insight, and "immediate apprehension". Peter Norman (1994) adds to this argument when he says that "...another blinding flash of the obvious! With all these flashes we must remember that a revelation is not a revelation unless it's our own" (p.2). It is here, that I wish to make a point. It is my belief that we all have a degree of scholarly wisdom and knowledge. This I refer to as intuition. Intuition gains credibility when it is corroborated by outside sources. An affirmation of intuition can occur through fiction and scholarly works. Brother William, in the movie, "The Name of The Rose" (1986) exemplifies this, when he states, "I'll wager my faith that, that tower contains something other than air," and he is right, it does! There are no facts or evidence to support his claim, merely his intuition. References to works of literature are based on my own intuition about what curriculum should look like and sound like, they are my revelations drawn out by others.

The voice inside me suggests they are glimpses of the work of philosophers like Jean Baudrillard. Baudrillard (1991) works from the premise of the "simulacrum", or insubstantial form or semblance of something. He lists three levels of simulacra and the one that I wish to begin with is the second, which includes science fiction, or the world of Douglas Adams. This level deals with the "hyperreal", or simulations more appealing than the real thing. Adams (1980) in his *Restaurant At The End Of The Universe* is an example of the second level. Patrons in the restaurant travel to the end of the universe, to the end of time, through time, and while dining, see the final apocalypse, the destruction of the universe as part of their dinner theatre, "then return home to your (their) own

eras... and raise families, strive for new and better societies, fight terrible wars for what you know to be right" (1980, p.97). In *Dirk Gently* "The Ghost" wants to return in time to undue a mistake. "Take me back, ...I beg you, take me back to the landing craft. Let me undo what was done... The landing craft can then return to the main ship, ...and I will cease to be a burden to you." (1987, p.228)

Both novels reveal the **non-linearity** that is part of the postmodern condition that could be applied to curriculum. Events do not have to be presented in chronological order. There has been a dearth of children's literature in recent years, like "Encyclopedia Brown" that provide young readers with a variety of choices and multiple endings to stories. Our world is cyclical, but that does not necessarily mean orderly. As an elementary level teacher I would teach Canadian History in conjunction with world events and not necessarily in chronological order. United Empire Loyalists were taught when refugees were on the move somewhere around our "global village", issues surrounding Confederation were best discussed during referendum debates, and the fur trade during the annual "Festival du Voyageur". These current issues are now readily available due to advances in technology. As a child some thirty-five years ago, I remember the televised funeral of Sir Winston Churchill. I can still recall the image of a large delta wing Royal Air Force bomber arriving in Dartmouth, Nova Scotia. It was acting as a courier of the film footage for the Canadian audience, prior to the era of satellite television. Today we see everything as it happens, where it happens and when it happens! Technology has brought pictures of the moment to the classroom via cable television, streaming video, and digital imagery.

Sam Keen (1970) is a philosopher, theologian and psychologist. He made an impact on my early university years and I often find myself returning to his book, *To A Dancing God.* In one chapter he talks about "Education for Serendipity". His advice to school districts is clear,

> I would like to propose that every educational institution, if it is to fulfill its central purpose of conserving and creating, should establish a department of "Wonder, Wisdom and Serendipitous Knowledge" which would be charged with the prophetic task of discovering the unfashionable questions which are not being asked and the life options which are not being explored within the educational system (p.42).

Bill Cosby (circa 1967) in his early years had a humourous dialogue entitled "Why is there Air?" This is an interesting question; his **ironic juxtaposition** is that it is for blowing up basketballs and volleyballs. Douglas Adams (1979) on the other hand, in search of the question gives us the answer. Like Freeman Patterson (1979) perhaps, Adams is "thinking sideways" when he has a computer named "Deep Thought" provide the answer – "forty two" and then leave all of the universe the problem of discovering what the question was. Venturing back into the realm of technology, Donald P. Ely (1995) writes, *If Technology is the Answer, What was the Question?* These examples all suggest that more important than the actual content itself in curriculum is the process, the critical thinking, the thinking sideways, the living, and the search for the answers - that is what is important. In Manitoba, as noted earlier, the content is represented by the subject area curriculums and the process encompasses the "foundation skills", including technology.

I believe Baudrillard (1991) could have actually co-authored some of Adams' work when he argues, "For ethnology to live, its object must die." and "science never sacrifices itself, it is always murderous" (pp.447-448). The restaurant at the end of the universe is based on the destruction and death of the universe, it is the "raison d'etre", that is why people dine there. Adams illustrates this idea with "Deep Thought". The creators of the computer are astonished when they discover that their super computer, the very best in the whole universe continually refers to itself as the second best. After much indirect comparison and questioning they discover from "Deep Thought" that it is the second best because, "I spare not a single unit of thought on these cybernetic simpletons, (its predecessors in the computer world) I speak of none but the computer that is to come after me!" (1979, p. 127)

These thoughts represent the postmodern idea of **supplement**. We add new, but one day the new is also replaced by the newer. Just when we think we have found the answer, when we have completed the ultimate task, or reached the goal, the bar is raised, and there is something more to learn, a greater accomplishment to be achieved. Frank Lloyd Wright was once asked what his best piece of architecture was; his response was that it would be his next one. So it is with curriculum. The newest document is a reflection of that moment in time. To avoid the murderous science, suggested by Adams (1979) it must remain active and bring life to tomorrow; it must be flexible and adapt to the changing world.

Fraggle Rock was a CBC television series during the 1980's that spawned a series of children's books. In the books, Doozers were little subterranean creatures that loved to build. No sooner would they complete a project than they would deconstruct their building and use the materials to reconstruct a better place. In one such book, *Cotterpin's Perfect Building* (Weiss, 1986) Cotterpin was just such a Doozer. As an architect, she wished to build the perfect building and did not want to take it apart. It was only after a few days that she began to realize her project could be improved here or there and agreed to reconstruct anew. Our curriculum, and the use of educational technology, needs to be constructed, deconstructed and reconstructed to keep it "rich, recursive, relational and rigorous" (Doll, 1993, p.176).

A living, breathing, rigorous, and real curriculum should be evolving; it should be **supplemented.** Postman (1992) creates an interesting discussion on what he calls a technopoly. His suggestion is "the curriculum itself may be seen as a celebration of human intelligence and creativity, not a meaningless collection of diploma" (p.188). Similar to Sam Keen, Postman argues for the story in "*his-story*". "I mean a story of human history that gives meaning to the past, explains the present, and provides guidance for the future" (Postman, 1992. p.172). Postman offers an historical perspective on technology. His first example is a dialogue with Thamus, the King of Egypt and Theuth, an inventor of many things. The story recounts the introduction of writing and the implications of the "new technology".

> "Theuth, my paragon of inventors, the discoverer of an art is not the best judge of the good or harm which will accrue to those who practice it. So it is in this; you who are the father of writing, have out of fondness for your off-spring attributed to it quite the opposite of its real function. Those who acquire it will cease to

> exercise their memory and become forgetful; they will rely on writing to bring things to their remembrance by external signs instead of their own internal resources" (Postman, citing Plato, p.4).

We move from these ancient concerns for technology to modern day concerns that "they (computers) can impede creativity", according to the Alliance for Childhood. (Montreal Gazette, September 18, 2000)

What is the point? As practitioners, we can learn from scholarly research and we can also learn from authors, actors and artists. Earlier, there was a pun accredited to Marshal McLuhan, let us now turn that pun around and credit William Shakespeare, the original author, who was the first to suggest that, "All the world is a stage". As teachers we are the actors. We present the joy, the laughter and sometimes the tragedy. The curriculum we use must provide the freedom of expression that allows children to be exposed to those ideals and many more.

I have attempted to show some of my own connections with how curriculum takes on meaning in classrooms. Informational and educational technologies are part of the new curriculum and need to be embraced and integrated with the current subject areas. These are my thoughts, but even as this ink is drying, new ideas flow and like Cotterpin, it may be time to start the curriculum review again.

**The Provincial Curriculum**

Having made the argument for theoretical curriculum I wish to take a moment to discuss the fact that some might suggest that we **do not** have an "educational technology" curriculum in Manitoba even though we do have the document *Technology as a*

*Foundation Skill* (Manitoba Education and Training, 1998). Educational technology by itself is not a curriculum in the sense of educational governance, it has not been identified as a core subject, and so a curriculum guide document does not exist. The TFS document is a discussion paper that proposes beliefs and ideas on the subject of Information Technology, as they prefer to call it. The document even goes so far as to suggest skill sets and the three "Levels of Information Technology Literacy Continuum" (pp 17-18).

Manitoba Education and Training (MET) instituted a series of documents entitled *Renewing Education: New Directions*, (1994 and 1995) in an attempt to restructure Manitoba Schools and to provide public accountability through excellence measured by provincial standards of achievement. It was here that educational technology's place was established in what the Department referred to as a "foundation skill", which is one of four components of a core subject curriculum.

> The foundation skill areas will be required from kindergarten to Senior 4. They are fundamental in both teaching and learning and will be part of instruction in every subject area. Each foundation skill area represents a set of skills that will enable students to transfer and apply knowledge and allow teachers to design instruction for these purposes. They encompass both the "what" and "how" of teaching and learning across all subject areas (MET, 1994. p.8).

The Department does make the clarification that "Computers" as a subject area may be used to supplement experiences that students receive through the foundation skills taught in every subject and at every grade level; however, this for the most part applies to middle and senior schools, not elementary. What I would like to do is connect "foundation skill" and "curriculum" and attempt to treat them as a synonymous term in a philosophic sense. As noted earlier, the Merriam Webster (2000) definition of

curriculum is, "the courses offered by an educational institution." In Manitoba all teachers must teach the four foundation skills in all subjects at all grade levels (*A Foundation for Excellence*, 1995). Therefore, I believe the foundation skills MUST be the Manitoba curriculum and the core subjects with their documents are the vehicles of these foundation skills, the overriding provincial curriculum.

Although I have never seen the movie *Back To The Future*, I like the title. If Manitoba has made a move back to the basics, and returned to the three "R's", it has done it with a modern day twist by insisting on technology as a foundation skill/curriculum for the future. Recent articles in the *Winnipeg Free Press, National Post, McLean's* and other major Canadian news publications have questioned the use of technology in the classroom. "Computers are 'another thing in the class that (teachers) have to deal with,' on top of the challenge of educating children, says Richard Smith, director of Simon Fraser University's Center for Policy Research on Science and Technology" (Winnipeg Free Press, December 2, 2000 p.C8). Groups like this, and the "Alliance for Childhood" cited in Chapter One, continue to question the wisdom of integrating technology into the classroom. It then behooves researchers to take up this challenge.

**Curriculum Integration**

The expectations placed on the school system by the public appear to change all too frequently. The creation of documents, by Manitoba Education and Training, that define the elementary school programming to the minute, makes it increasingly difficult to provide the postmodern curriculum described earlier in this chapter. Manitoba has

prescribed the minimum teaching day to be 300 minutes. In that typical day, a minimum of 225 minutes must be spent teaching the four core subjects, English Language Arts, Mathematics, Science, and Social Studies. An additional 55 minutes is given to the compulsory complementary courses of Physical Education and Arts. The remaining 20 minutes of the day may be allocated to optional supplementary courses (*New Directions-The Action Plan*, p.64). This requirement prevents any additional subjects or in some cases even topics from being introduced within the defined day.

Curriculum integration may occur for a number of reasons. The province may recommend it when societal pressures demand schools teach drug awareness, family life education, HIV awareness or even technology. Teachers may desire to integrate curriculum to include areas of special interest to them or to include special interests of their community, or to take advantage of special events, like elections, the Olympic games or other major discoveries. "In essence, curriculum integration reflects the need for children and educators to gain knowledge which will help them make decisions for leading healthy, productive lifestyles" (James & Adams, 1998. p.2). This sort of integration can occur by selecting thematic units or relating curricular concepts to real life situations or issues. The main goal in curriculum integration is to link selected activities back to the core subjects.

In order to bring out the "rich, recursive, relational and rigorous" curriculum as Doll (1993) suggests, I believe teachers have moved towards **integration** on another level. "Curriculum integration is the result of thinking about the purposes of schools, the

sources of curricula, and the uses of knowledge. With this is mind, curriculum integration is the act of bringing two or more disciplines together for the purpose of making one curriculum which reflects the qualities of all the disciplines and gives maximum benefit to the learner" (James & Adams, 1998. p.2). I would like to suggest that it is at this level that the integration of a foundation skill with a core subject takes place. I agree with James and Adams when they suggest that curriculum integration is as much a reflection of an individual's philosophy about teaching and learning as it is about the presentation of a curricular subject. As mentioned earlier this is also reflected in the reasons to engage in the integration process. The foundation skills that form the basis of the Manitoba Curriculum are, in essence, belief statements. I believe that teachers will assimilate and conform to them at their own level.

Waxman and Huang (1995) reported that, as researchers, they saw no evidence of integration of educational technology in 200 urban elementary schools in the United States. As I read the paper, I thought that I too, could affirm these results in my own school, given the right observational conditions. I also know that I could disprove these findings providing the correct procedures were in place. Some teachers integrate while others do not. What are the key factors to consider when looking at barriers to integration? As Ertmer et al (1999) suggest, there are two distinct levels of obstructions to curriculum integration. They say teachers may recognize the importance of technology integration; however, they are hampered by internal (level one) and external (level two) barriers.

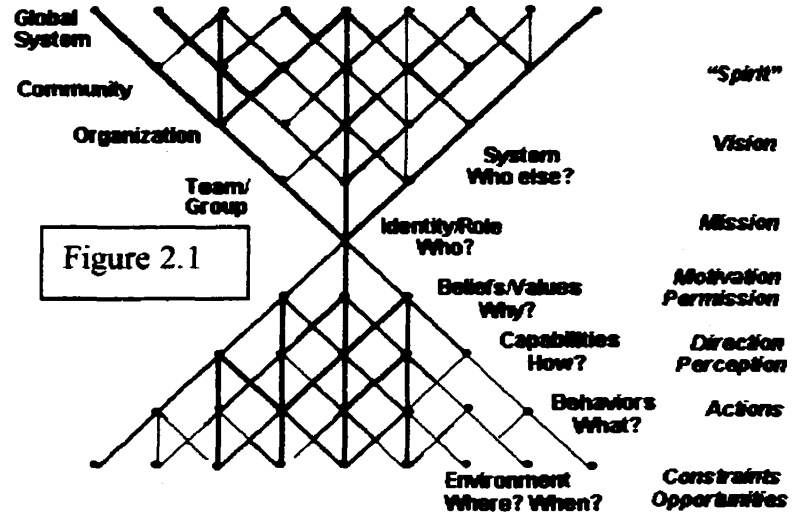
A first-degree barrier involves adjustments to current practices of teaching, making them appear more effective and or efficient, but without making major changes in personal belief systems. These are also referred to as extrinsic barriers and include some of the basics like lack of hardware, software or time to prepare, plan or become comfortable with the technology. These are simple barriers in the sense that "money" can solve these problems. Robert Dilts (1998) refers to these as "environmental factors." In the curricular sense, I would liken these to the textbook. To improve student achievement, you could change the curriculum guide, buy a new book or series, acquire your encyclopedia on a CD-ROM, or perhaps keep the same books and create a warm class setting. In, *Teaching With Technology*, Lloyd (2000) makes solid arguments for why these are important, but in many cases his suggestions involve detailed planning when building an information technology classroom. Some of those plans can certainly cause major frustration when teaching with technology and involve issues like lighting, sight lines, projection clarity, easy access to control panels, and menus. Although changing some of these small infrastructure issues may seem like small changes, they may facilitate the larger issues. These changes may be necessary, but using Dilts' analogy, they are part and parcel of a "nest" and only represent part of the solution. "The greatest barrier to eLearning may not be technology or resources, but our preconceived social norms and beliefs" (sSchoolNews, Dec. 8, 2000). The article goes on to suggest that some of the barriers are more complex and may require changes in attitudes and beliefs. The authors of this article argue that we must:

- "Overcome the preoccupation that access to the world of ideas and instant communication is dangerous and anti-social.
- Move from a 'seat time' mentality and adjust the idea that learning results are more important than attendance in a traditional classroom.

- Invest in teacher education and training to use the best the new technology has to offer.
- The educational infrastructure must prepare to adjust budgets to reflect the availability of new resources" (Trends Report 2000).

The second-degree barriers "confront beliefs about current practice and lead to new goals, structures, or roles. Second-order barriers are intrinsic to teachers and include beliefs about teaching, beliefs about computers, established classroom practices, and unwillingness to change (Ertmer, et al, p.2). Other researchers pick up on this salient point. Change does not easily occur unless teachers believe in the cause. (Dilts 1998, 1996; Fullan & Hargreaves, 1992; Fullan & Stiegelbauer, 1991) Our personal beliefs are a very powerful influence on our behaviour. It is a widely understood and accepted fact that if someone really believes he can do something, he will manage to accomplish it; but if we believe something is impossible, no amount of effort will convince us that it can be done (Dilts, 1998). Figure 2.1 is a graphic representation of Dilts' nesting levels of change and leadership for change.

Figure 2.1




(Dilts, 1998, p.4), (Also Referred to as "Nested Levels of Learning" Dyer, p.10)

This particular image is from Dilts' web article; however, John Dyer (2000) from the Institute for Intelligent Behavior also utilizes it. Dyer and his associates have built this concept into the theory of cognitive coaching. They suggest that if you wish to make meaningful change you must focus on beliefs, values and identity. As Dilts (1998) states, "Beliefs and values provide the reinforcement that supports or inhibits capabilities and behaviors" (p.5) Theorists from many fields come together in agreement on the next concept. Dilts (1998) calls it, "influencing peoples' heart..." (p.5), Sharma (1998) calls it "... leading from the heart..."(p.105), and in cooperative learning, Johnson and Johnson (1989) call it "encourage the heart" (p.10:8).

The integration of educational technology may require some changes in how programs of instruction are delivered. It will be important to take a close look at teacher practices in the classroom as well as teachers' beliefs to determine what, if any, changes need to occur. The past practice of adding more dollars to the budget to supplement equipment addressed the Level One issues of the environment; we now need to examine the Level Two barriers to truly assess the impact of the change on the elementary classroom. "Before teachers embrace technology as an effective tool for teaching and learning, they must believe that what they are being asked to do will work and that it is the best available solution to an identifiable educational problem" (Ertmer et al, p. 13).

**The Change Process**

Educational or school reform is an important concept, if for no other reason than it will become part of the identified issue of integration of technology in the classroom.

This is sometimes referred to as simply change or better still, improvement. Fullan and Stiegelbauer (1991) suggest that, "implementing any strategy for improvement is itself a fundamental implementation problem" (p.213). The focus in this instance will be change for proposed improvement at the teacher or classroom level. Fullan and Hargreaves (1992) created an interesting title for their monograph, *What's Worth Fighting For?* They argue that we should ask ourselves, what are we currently doing that is worth keeping? Stated differently, what new innovation or practice can we add to our repertoire of teaching that will lead to improvement? In my study of technology integration into the elementary classroom, there will be both ideas to fight for. There will be the fight to maintain effective practices, as well as the suggestion to fight for change that leads to improved classroom teaching and learning.

A number of researchers have written on school change, (see Costa & Garmston, 1994; Fullan & Hargreaves, 1991; Fullan & Stiegelbauer, 1991; Wallace, Engel, & Mooney, 1997; Wohlstetter, Van Kirk, Robertson, & Mohrman, 1997). These articles discuss the renaissance school, strategic planning, school-based management, the learning school, and meaningful educational change. The ideas that come through loud and clear are represented in quotations like, "However noble, sophisticated, or enlightened proposals for change and improvement may be, they come to nothing if teachers don't adopt them in their classrooms and if they don't translate them into successful practice" (Fullan & Hargreaves p.13). "Actively restructuring schools involved a variety of stakeholders in school governance, including individuals from the community. Schools that were most successful involved staff, parents, and sometimes

students in making decisions" (Wohlstetter, Van Kirk, Robertson, Mohrman, p. 5). "The development of a vision supported by all major stakeholders prevents school reform from becoming a casualty of intragroup sniping and subversion" (Wallace, Engel, Mooney, p.91). Change involves people, and usually includes those people recognizing their beliefs in scholarly work, or modifying their beliefs to facilitate the change process.

Even at the simplest level, innovative practices like curriculum integration are multidimensional. Fullan and Stiegelbauer (1991) support the research of Ertmer et al (1999, p.37) when they suggest there are at least three dimensions or components in implementing change. The levels include the possible:

1. Use of new or revised *materials* (direct instructional resources such as curriculum materials or technologies),
2. Use of new *teaching approaches* (i.e., new teaching strategies or activities),
3. Alteration of *beliefs* (e.g., pedagogical assumptions and theories underlying particular new policies or programs).

In analyzing the change process one must study the degree of change or adoption at each level. It is possible that a change only occurs at the materials level. A piece of software or computer platform is utilized with the same teaching approach and the same basic beliefs. In this situation the actual change and development would be marginal at best. As we look at a change in schools that integrate educational technology there must be an awareness of what changes have evolved in the integration of educational technology in the classroom. As the educational connoisseur involved in this research, I must focus on each of these three aspects of the change in order to fully comprehend the subtle nuances of successful classroom practice of integration of educational technology. It is the

complete understanding of these three factors that should enable me to describe best practices and then be able to encourage more of it to occur.

**Chapter Summary**

In this chapter I have attempted to review the literature that is pertinent to the key concepts I have linked to the study. Some of the research has been web-based, relying on information available through the University of Manitoba Library databases like ProQuest, EbscoHost and ERIC listings. These were supported by timely, yet unsolicited sources from the Canadian Association of Principals Listserv. Some of the electronic sources provided bibliographies that directed me towards conventional library holdings and finally some leads came about through the daily newspapers and newsmagazines.

I have argued that a *new curriculum* is based on a post-modern theoretical description that I believe can become the overriding principle for the way that children should be taught in the elementary years. This instructional approach includes the integration of technology and will likely mean change for many teachers. There are barriers to change, and those barriers are realized at two or three different levels. If these changes do occur, care must be taken to insure the practices and beliefs become part of a teacher/school culture to insure their successful implementation.

# Chapter 3

# Methodology

> *If qualitative inquiry in education is about anything, it is about trying to understand what teachers and children do in the settings in which they work.* (Eisner, 1991, p.11)

## Initial Discussions and Background

In 1999 a group of Fort Garry School Division teachers involved in a joint research partnership with the University of Manitoba decided to proceed with an analysis of educational technology in the elementary years. The group saw a need to survey elementary years teachers in the Fort Garry School Division, to formulate a picture of what was happening in the area of teaching with computers. The *raison d'etre* was to respond to the criticisms, that a great deal of financial resources had been committed to "computers" and that there was little to show for it in terms of student achievement.

To better understand the context of what 'the great deal of resources' represents, Table 3.1 indicates total divisional budgetary expenditures in the area of information technology. It is difficult to break down the categories to specific dollar value designated to the Kindergarten to Grade 6 program; however, the public perception is that in the two-year period identified,

**Table 3.1**
**Information Technology – Fort Garry School Division #5**

| Year: | 1998-1999 | 1999-2000 | Total: |
|---|---|---|---|
| Services: | $ 275,968 | $ 262,223 | $ 538,191 |
| Equipment | $ 607,333 | $ 665,548 | $ 1,272,881 |
| Total: | $ 883,301 | $ 927,771 | $ 1,811,072 |

(Source: Fort Garry School Division – Secretary Treasurer's Department)

in excess of 1.8 million dollars was spent on technology in the Fort Garry School Division.

There are numerous studies that have attempted to address the effect of technology on student achievement. Those that I have seen suggest that teaching with technology can improve student achievement. The eSchool News reporting on the Trends Report 2000 proclaims on behalf of the software industry, "The digitization of the school operational processes will provide more bang for the education buck, software and online content will continue to improve, and the public will begin to see a payoff for the investment being made by school..." (Guerard, p.4). One particular Canadian study for SchoolNet states, "In situations where appropriate support conditions are provided to the teachers using ICT, (Information and Communication Technologies) increases in student learning are found" (Laferriere, 1999, p.5). The study goes on to look carefully at the subject and notes that in longitudinal studies in the United States, the classrooms "do look different". This thesis will examine what those differences look like and to analyze what the "appropriate situations and support conditions" are that lead to improved student achievement.

**The Initial Plan**

After the early discussions held by the study group, (Dave Benson, Elaine Egan, Denis Hlynka, John Howden, Jim Welsh, and Leona Wiens) Wiens embarked on a search of survey of instruments that were created to address teachers' attitudes towards educational technology. The result was dozens of web-based sites that had been used by

schools and districts primarily in the United States. They included well known resources like StaR Charts from the CEO Forum, The Texas Centre for Educational Technology (TCET), The North Central Regional Educational Laboratory (NCrtec) and the Utah Technology Awareness Project to name but a few (see Table 3.2). These sites were then passed to me for compilation into a "made for Fort Garry" survey, aimed originally at a K-4 audience but later adapted to the entire range of the elementary program.

| **Table 3.2** | **Popular Web Based Survey Instruments:** |
|---|---|
| **Source:** | **Web URL:** |
| StaR Chart | http://www.ceoforum.org/ |
| TCET | http://129.120.113.30/research/index.htm |
| NCrtec | http://www.ncrtec.org/capacity/profile/profwww.htm |
| UTAP | http://wwwj1.uen.org/UTAP/ |

The initial plan was that this study would be quantitative in nature. In fact, an instrument was created (Appendix C) that may enable researchers examine teachers' beliefs and attitudes towards technology. As the fourth draft was being prepared, it was shared with Elaine Egan, a third member of the study team. In preparation for her own comprehensive exams, she was asked to "deconstruct" the draft instrument. Working independently in the Spring of 2000 Egan and I came to the same conclusions about the survey being constructed and I decided to move to an open-ended survey, along the lines of a John Belland (1991) and Elliot Eisner (1991) "connoisseurship" model of educational criticism.

In analyzing the instrument my colleagues and I believed that the original plan was flawed and may have provided unreliable data, or data that could be misunderstood and or misinterpreted. Frankel and Devers (2000) support the rationale for changing research models. They state that, "Qualitative methods are needed when the questions being asked pose puzzles that are difficult, if not impossible to address using conventional research approaches" (p.2). An example of this can be seen in the belief statements on teacher professional development shown in Figure 3.1.

| **Figure 3.1** | **Please select the box that best reflects your belief where: SD = Strongly Disagree and SA = Strongly Agree.** | | | | | |
|---|---|---|---|---|---|---|
| | | **SD** | **D** | **U** | **A** | **SA** |
| 1 | I believe that textbooks will be secondary to electronic media within 5 years. *This means my teaching style will need to change to accommodate the shift.* | | | | | |
| 2 | I believe that the role of schools will be dramatically changed because of the Internet. *This means my teaching style will need to change to accommodate the shift.* | | | | | |

(Italics represents modifications made after the fourth draft)

Egan, Hlynka, Welsh and Wiens who reflected on the questions, wondered why these "belief" statements were included in a survey on attitudes. They had been included, because, I saw them as critical beliefs. I argued that those responding in *Agree* or *Strongly Agree* categories would be aware of the impact that these statements would have on teacher service and pre-service training and professional development. Those beliefs would have reflected an attitude towards acceptance of effective professional development opportunities. The debate that followed suggested, that as a closed survey question, the responses from teachers completing the quantitative survey would not necessarily reflect my intention, in asking the original question.

In a second case, the flaw could be that the resultant answers may have supplied misleading information. For example, in the questions in Figure 3.2, the time indicated

Figure 3.2

2) Students engage in Internet-based activities for curricular purposes during the school day: (minutes/week)

___ 0 minutes ___ less than 15 minutes ___ 15-45 minutes

___ 46-90 minutes ___ more than 90 minutes

by the teacher may not be indicative of the *quality* of time spent on the Internet. Answers of *More than 90 minutes* might suggest extensive and creative use of the students on the worldwide web. On the other hand, it could also suggest inability of teacher in structuring appropriate learning experiences and or inability of students to conduct effective searches. Weak hardware and or slow connectivity could also result in long wait periods or slow downloads of information.

Would the interpretation of the quantitative data of less time be a negative reflection? In reality, this could be representative of fast efficient machinery and/or effective student work? As McCracken (1988) explains, "Without a qualitative understanding of how culture mediates human action, we can know only what the numbers tell us. The long qualitative interview is useful because it can help us to situate these numbers in their fuller ... context" (p.9).

**A Change in Plans**

The quantitative data had potential, but it was determined that the information sought required detail, depth, and above all, discussion. It was becoming evident that, "a pre-formulated plan of procedure indifferent to emerging conditions (was) the surest path to disaster. Flexibility, adjustment, and iterativity are three hallmarks of qualitative method" (Eisner, 1991, p,170). For these reasons, the methodology was changed from a quantitative to a qualitative research model.

As a new model was being selected, consideration was given to a multi faceted approach to the qualitative research. Ted Aoki (1991) suggests that there are three ways to assess the effectiveness of curriculum. He discusses Habermas' paradigms and re-labeled them:

1. Ends-Means (Technical) Evaluation Orientation.
2. Situational Interpretive Evaluation Orientation.
3. Critical Theoretic Evaluation Orientation (Aoki, 1991, p.66)

Aoki and his research team used all three streams to assess the provincial Social Studies curriculum and report to the British Columbia (Canada) Department of Education in 1977. With an experienced team and the appropriate resources, this approach provides an exhaustive analysis of a topic. I became very interested in his Critical Theoretic Evaluation Orientation because of its similarity to connoisseurship. Aoki identifies six questions that are important considerations for this orientation:

1. What are the perspectives underlying Curriculum X?
2. What is the implied view of the student or the teacher held by the curriculum planner?
3. At the root level, whose interests does Curriculum X serve?
4. What are the root metaphors that guide the curriculum developer, the curriculum implementer, or curriculum evaluator?

5. What is the basic bias of the publisher/author/developer of prescribed or recommended resource materials?
6. What is the curriculum's supporting worldview?

(p.75)

Although I believed this may be the best way of conducting the project it was beyond the means of one individual conducting their first formal research project to attempt all three tasks. The new challenge then became choosing my approach to the question.

"I know of no 'method' for the conduct of qualitative inquiry in general or for educational criticism in particular. There is no codified body of procedures that dictates how to produce a perceptive, insightful, or illuminating study of the educational world. Unfortunately—or fortunately—in qualitative matters cookbooks ensure nothing" (Eisner, 1991, p.169). A qualitative approach utilizing criticism or the connoisseurship model can include many sophisticated ways of gathering data for evaluation purposes. The actual methods can become very complex utilizing audiotapes, a videotape recorded lesson presented by a teacher, data gleaned from observation of students at work and even displays of student work on bulletin boards. Eisner says, "My main aim, however, is not to construct a laundry list of potential data sources for educational connoisseurship..." (1991, p.81) nor is it mine. In fact, it is my intent to keep the process very simple, on a first effort, and to focus on the long answer interview, supplemented by observations of the physical structure of the school itself.

It is with some trepidation that I acknowledge comments made by Rex Gibson (1991). An opponent of the qualitative approach, it is with some cynicism, that he is critical of the researcher, on a personal level. "What is being demanded here is not

simply that the critic can be a critic; he must be an artist too. As we shall see, it is very difficult for the average human being to resist such a flattering and seductive invitation" (p.487). He goes on to label qualitative research as "...narcissistic, self indulgent..."

In this thesis I have selected the long answer interview style questions. This approach allows the researcher to step into the mind of another, "to don the shoes of another human being" (Eisner, 1991, p.37) and see the world as they do. Creswell, (1994) Easton, McComish, and Greenberg, (2000), Eisner, (1991) and McCracken (1988) warn of the dangers and pitfalls that must be considered when attempting to work in the area of qualitative research using the long answer interview process. Eisner (1991) lists six features, McCracken (1988) focuses on nine key issues, while Easton, McComish and Greenberg (2000) talk of three pitfalls and Creswell (1994) supplies a checklist for designing a qualitative procedure.

**Instrument Design**

The instrument design can be simple or complex. It is important to keep in mind that the researcher is the instrument in the qualitative inquiry (Eisner, 1991). As the researcher, I needed to create long answer interview questions that would answer my three research questions. In order to answer these three research questions, I created six questions that were designed to elicit a variety of responses: direct factual information, teacher beliefs, opinions, dreams and visions. The respondents' answers to these six questions where then filtered back into the three research questions. (See Figure 3.3) If

the initial questions elicited a minimal response, probing questions were posed (see Appendix B) for more detailed answers.

| Figure 3.3 | | | |
|---|---|---|---|
| **Long Answer Interview Questions:** | | **Research Questions:** | |
| Part II | | | |
| 1 | Could you please describe for me what the term "educational technology" means to you? | 1 | How do the educational technology leaders in the elementary years define educational technology? |
| 2 | When were you first aware that you were integrating educational technology as part of your teaching repertoire? | 2 | What are some of the significant stories/experiences that technology leaders talk about:<br>a) when they first started integrating technology into their teaching;<br>b) b) and, how they are integrating technology now? |
| 3 | Could you please describe for me a significant activity for you and or your class that involved the integration of educational technology? | | |
| 4 | The editor of a distinguished educational journal has just invited you to submit an essay on your use of educational technology in the classroom. What is the title of your article and what are the key points for discussion? | | |
| 5 | How can we as individuals, school staffs or a division cause more integration of educational technology to occur in our classroom/schools? | 3 | What issues, concerns and recommendations have the educational technology leaders identified as critical to the integration of educational technology in the elementary years? |
| 6 | Are there any issues or concerns regarding the integration of educational technology in the elementary classroom that you wish to add? | | |

## Six Features of Qualitative Inquiry

"Few writers agree on a precise procedure for data collection, analysis, and reporting of qualitative research" (Creswell, 1994, p.143). "Some scholars believe that literature should be reviewed prior to beginning a study; others argue this may impede the researcher from truly listening, observing and remaining open to new concepts and ideas" (Frankel and Devers, p.1-2). "The researcher should also be the interviewer and the transcriber, however this is not possible or feasible in many cases" (Easton, McComish and Greenberg, 2000, p.707).

Although Eisner (1991) prefers not to follow an actual step-by-step process or method, I have turned to the works of McCracken (1988) and Creswell (1994) as their models best exemplify the process that I will follow. I have identified six features that are common components of McCracken's and Creswell's work: 1) the assumptions of the qualitative design, 2) data collection, 3) data recording procedures, 4) data analysis procedures, 5) verification, and 6) the narrative outcome.

### Feature 1: The Assumptions of Qualitative Design

There are at least five distinct assumptions, they are: 1) the group sampled, 2) an inductive process, 3) self as instrument, 4) fieldwork, and 5) environmental hazards.

The first assumption of the qualitative design is the nature of the sample group. This is the fundamental difference between qualitative and the quantitative processes.

McCracken says, "the first principle is that 'less is more'. It is important to work longer, and with greater care, with a few people than more superficially with many of them" (p.17). It is for this reason that the sample to be interviewed is not to exceed one person per school and not likely more than a dozen in total. The person from each school will be selected or nominated by their principal as someone who is recognized as comfortable with the integration of educational technology and/or a technology leader in the building. There is no random sample and it is not expected that the group will be representative of a larger population. The data the nominated group supplies may very well be skewed in favour of technology; however, the patterns or interrelationships that may emerge from the dialogue are of greater interest than is the physical data. I will be looking for how the participants "make sense of their lives, experiences, and their structures of the world" (Creswell p.145).

The second assumption is that qualitative research follows an inductive process. (see Creswell, 1994; Frankel & Devers, 2000, McCracken, 1988) "The qualitative researcher's task often consists of describing and understanding people and groups' particular situations, experiences, and meanings before developing and/or testing more general theories and explanations" (Frankel & Devers, p.3). This, in itself, poses other cautions for the qualitative researcher. Again it is process and as such it is ongoing. It is "dynamic". "The qualitative researcher expects the nature and definition of analytic categories to change in the course of a project" (McCracken, 1988, p.16). It is partially for this reason that I provided narrative background at the beginning of this chapter. I

have indeed made changes in this project, even before it came down to actually commencing the research itself.

The third assumption is the self as an instrument. (Creswell, 1996; Eisner, 1991; McCracken, 1988) The qualitative researcher is the primary instrument for data collection. McCracken refers to this as a metaphor and explains that as the instrument, researchers must filter all information through their personal experiences. "The qualitative researcher uses a lens that permits a much less precise vision of a much broader strip" (p.16). Once again referring specifically to McCracken, he uses expressions like "winnow(ing) the data" and "rummaging process" (p.19). The research into autobiography as educational research discusses the influence of "self". The Backhouse (1997) dissertation is a journal of life experience related to the implementation of an educational technology plan in his small rural school. Graham (1991) devotes his book, *Reading and Writing the Self* to a better understanding of how autobiography plays a significant role in research. Sam Keen (1971) was the first to draw the "I" influence to my attention. "I have found it necessary to search for the foundations of my identity and dignity in the intimate, sensuous, idiosyncratic elements of my own experience. I have had to discover the principles without which I could not be. I share my reflections because I am convinced that my story is not atypical" (p.2).

McCracken asks a key question, "Who does the respondent think the investigator is" (p.22)? There are many variables here, mostly dealing with first impressions: appearance, dress, speech, personality traits, title, etc. One important lesson is that the

investigator must control as many of these cues as possible, and must also be aware of the influence the uncontrolled ones may have on the way the interviewee responds to questions. McCracken talks about the balance between formality and informality, and about risks:

> The respondent in a qualitative interview is subject to several risks. Participation in qualitative interviews can be time consuming, privacy endangering, and intellectually and emotionally demanding in ways that quantitative interviews rarely are. To make matters worse, it is difficult for many respondents to anticipate these dangers at the outset of the interview. Investigators must take pains to see that the respondent is not overtly or subtly victimized by the interview process (p.27).

In this particular study I may be acquainted with those being interviewed; I may have taught with some or even served as their vice principal. My own school was on the list and I could have been perceived as the "administration". That type of relationship may have impacted on the responses from a teacher on staff. In this particular situation, I was ready to request the school principal participate in the interview; however, the nominated teacher felt comfortable answering the interview questions.

The fourth assumption is fieldwork (Creswell, 1994; Eisner, 1991; McCracken, 1988). The researcher must go out to observe the actual setting and engage the people in their natural surroundings. It is through this authentic practice that real discoveries are made. McCracken relates his own experience in research involving an elderly woman. "As I listened to her, a new perspective arrived suddenly and with force. 'My God' I thought, this isn't a household, it's a museum. Its furnishings are not inanimate objects and consumer goods, but memorials" (p.20). In this particular study, my fieldwork could involve visiting as many as thirteen different sites. The fieldwork is more than going out

to conduct a long interview with a teacher. "The field focus that I describe is not limited to places in which humans interact, it also includes the study of inanimate objects: school architecture, ... classroom design, ... anything that has import for education is a potential subject matter of qualitative study" (Eisner, 1991, p.32). Although, my primary source of data is the interview, I will remain cognizant of physical factors and features of a school's structure, age and demographics.

Easton, McComish and Greenberg (2000) caution the investigator on the fourth assumption, environmental hazards. They support multi-site studies as providing "rich data" but remind the researcher of the attention to details when gathering information in unfamiliar settings. In my project, the preferred site will be the nominated member's workspace, although as promised, the time and location will be at the interviewee's convenience. It is my belief that the participants will find it easiest to meet at their workplace rather than travel to unfamiliar surroundings, to "central office" or to my office. Although indirectly stated, I believe McCracken would also support meeting on "home turf". It provides a degree of comfort and control for the participant in a situation where the person asking the questions is really the one in charge.

**Feature 2: Data Collection**

The primary data collection process involved a long answer interview with a teacher in each elementary school in the Fort Garry School Division. In Chapter VIII of *The Enlightened Eye*, Eisner provided suggestions on gaining permission or access to participants. This process began in September 2000 with a letter to the Superintendent,

of the Fort Garry School Division, seeking permission in principle to proceed with the study. Secondly, an application from the University of Manitoba Research Ethics Board (REB) (see Appendix A) was prepared and submitted for approval. In late November, the REB reviewed the long answer interview application and gave approval for the questionnaire to proceed.

Once permission was granted, I was ready to collect the data. McCracken, (1988) identifies the development of the questionnaire as one of the key issues. "The entire success of the enterprise depends upon drawing out the respondent in precisely the right manner" (McCracken, 1988, p.21). Sharma (1998) in his fictional book on leadership says it is time to, "...stop listening with the intent to respond. Listen instead with the intent to understand" (p.101). The suggestion is consistent with Costa and Garmston's (1994) approach to "cognitive coaching" (I will reserve comment for cognitive coaching in the recommendations section in Chapter 6) "We need to listen to what people have to say about their activities, their feelings, their lives. ... It is surprising how much people are willing to say to those whom they believe are really willing to listen" (Eisner, 1991, p. 183). Although, Eisner (1991) cautions against the formal, questionnaire-oriented encounters, McCracken (1988) promotes it and lists four functions of the questionnaire:

1. It covers all the terrain in the same order.
2. It allows scheduling of the prompts necessary to manufacture distance.
3. It establishes channels for the direction and scope of discourse.
4. It allows the investigator to give attention to the informant.

(pp. 24-25)

The questions noted earlier and displayed in Figure 3.3 in this chapter were posed to each participant. Part I had been designed to serve as an "ice breaker", an opportunity

to establish a personal level of contact, prior to the key questions involving beliefs and practices in Part II.

**Feature 3: Data Recording Procedures**

Participants provided permission to tape record the conversations for transcription when they agreed to the interview process. The conversations were recorded using both a tape recorder and a dictaphone. A typist under my supervision transcribed the tapes. I took care to insure the proper working order of all mechanical devices. Easton, McComish and Greenberg (2000) dealt specifically with concrete suggestions in this area. They warn of most every possible problem ranging from equipment failure and dead batteries to extraneous noises like ventilation fans, telephones and school bells.

Participants were provided with a hard copy of the interview prior to my analysis. This was done to insure the transcribed document was accurate and that there were no errors in content due to misunderstanding the recorded tape or typographical errors. This strategy also provided participants a second opportunity to clarify or alter a previous statement prior to my analysis.

**Feature 4: Data Analysis Procedures**

Eisner (1991) devotes Chapter II in his book to characteristics of qualitative research. The discussion is more than just description of features of qualitative research; it becomes a defense of the practice as a *bona fide* mode of research. He begins by going to the heart of the matter, as he would expect a connoisseur to do. He presents

immediately the case for the results of the methodology. Using the knowledge of language he leads the reader through the evolution of the term empirical. He identifies the original intent of the Latin (*empericus*) and Greek (*emperikos*) roots to mean *experience*. Traditionally empirical evidence was reserved for scientific quantitative study. Eisner suggests there is a place for empirical evidence in the realm of qualitative research or the art of connoisseurship. "Neither science nor art can exist outside of experience, and the experience requires a subject matter. That subject matter is qualitative" (Eisner, 1991. P.27). McCracken (1988) strengthens this argument when he discusses the matches in experience that occur between interviewer and participant. "Matches require substantiation and confirmation from the remainder of the interview analysis. They must be confirmed over and over before they become admissible as evidence" (p.20). Repetitive social practices, commonly held beliefs, or accepted arguments become precedents in our society. These precedents become the accepted "truisms". This in turn becomes the empirical evidence of the qualitative investigative reporter, listening to the experts speak.

Eisner (1991) argues that we must also find a way to represent our experiences and that the most common way is through the medium of language. He goes on to say that, "One feature of a medium is that it mediates and anything that mediates changes what it conveys; the map is not the territory and the text is not the event. We learn to write and to draw, to dance and sing, in order to *re*-present the world as we know it" (p.27). This idea is similar to Marshall McLuhan's (1967) concept, *the medium is the message*. Stephen R. Covey must share the insight with Eisner because he cautions,

"Paradigms are like maps. They're not the territory; they describe the territory. And if the map is wrong-..." (Covey, 1997, p.8). As the researcher, I must be careful that the map is a common vision and the paradigm is shared. Again McLuhan and Fiore reflect on the idea, "Globes make my head spin. By the time I locate the place, they've changed the boundaries" (McLuhan & Fiore, 1968).

As I move from researcher to author and engage the writing phase, I take on the interpretive character (Eisner, 1991). "First it means that inquirers try to *account for* what they have been given an *account of.*" In the data analysis process the researcher is attempting to discover why something is taking place and the motives of the participants in the situation. Hopefully, the map or the account created is accurately reported through the researchers filters and does not change before the researcher has had the opportunity for final analysis.

This role can lead to the Eisner's fourth feature, expressive language or the author's personal voice, showing empathy and understanding as a result of personal life experiences. A contentious issue, the quantitative researcher "is often regarded as the enemy of cognition. I reject such a view. To read about people or places or events that are emotionally powerful, and to receive an eviscerated account is to read something of a lie. Why take the heart out of situations we are trying to help readers understand" (Eisner, 1991, p.37)? Chapter Four, the report of the interview will be written in a narrative form, to maintain the passion and artistry that represents the best practices as described by the educational technology leaders.

**Feature 5: Verification Procedures**

It is this area that causes concern among the members of the scientific research community. In quantitative research there is the whole field of statistics to verify and validate findings. In qualitative research it is different. "Qualitative researchers have no single stance or consensus on addressing traditional topics such as validity and reliability" (Creswell, p.157). McCracken (1988) attempts to create a list of qualities that data should exhibit, and ironically they are adapted from a scientific theory model. He says,

1. It must be exact, so that no unnecessary ambiguity exists.
2. It must be economical, so that it forces us to make the minimum number of assumptions and still explain the data.
3. It must be mutually consistent, so that no assertion contradicts another.
4. It must be externally consistent, so that it conforms to what we know independently know about the subject matter.
5. It must be unified, so that assertions are organized in a manner that subsumes the specific within the general, unifying where possible, discriminating when necessary.
6. It must be powerful, so that it explains as much of the data as possible without sacrificing accuracy.
7. It must be fertile, so that it suggests new ideas, opportunities for insight.

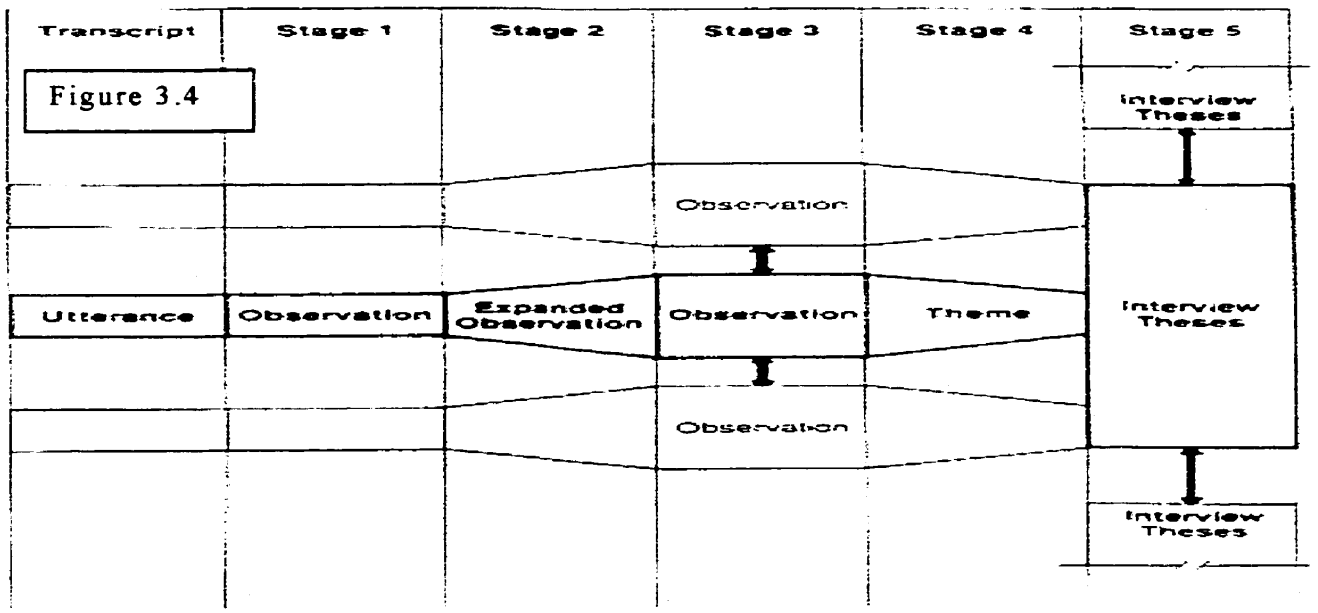
(p.50)

These principles do not necessarily guarantee truth, but within the realm of qualitative research there are multiple truths. In discussing validity, we might consider utilizing the analogy of law. Eisner (1991) says we do not require certainty, only reasonable doubt about the validity of the verdict. He goes on to argue that we can never be absolutely certain that we have found truth; that we are always "stuck with judgments and interpretations" (p.109). There may be literal and metaphorical truth. Although not factually accurate, these truths can also teach and influence our choices. The works of

literary greats like Shakespeare serve as a prime example. Adherence to McCracken's (1988) principles will require the attention of a connoisseur, someone who knows the field of study intimately, and someone who can see the parallels and draw the analogies.

**Feature 6: Narrative Outcomes of the Study**

The final report of findings will be in the form of a descriptive narrative. Even though this part sounds relatively easy it will represent a challenge. McCracken (1988) makes the simple point that writing up the results can be difficult. Some of the difficulty is as basic as compiling the information.




(McCracken, p.43)

Frankel and Devers (2000) warn that it could take between 4-6 hours to transcribe one hour of audiotape, this project could equate up to 6 hours of tape. The management and analysis of data is shown Figure 3.4. "Most of the work that remains is the laborious process of herding these observations and insights into a single pasture" (McCracken, 1988, p. 53).

The figure provides a graphic depicting how the narrative will be structured. Beginning with transcript, the utterances are reviewed for literal meaning and little concern for the part the comment may play in the bigger picture. McCracken (1988) refers to this as the archaeologist stage, where important comments are sorted from marginal or non-important comments. In Stage 1, choices and selection begins, "utterance to entranceway". At this point care should be given not to advance to assumptions, but rather treat metaphors literally. McCracken says that, this is where the interviewer starts to become the instrument, to read the data as well as interpret how the data impacts on the self. The intuition comes to a conscious level and matching literature reviews with interview data starts to take place. Stage 2 has three sections. The original idea is extended allowing its implications and possibilities to surface. A list of observations is created and there is an attempt to build relationships, similarities, including opposition and contradiction amongst them. Stage 3 is one of refinement. Patterns and themes should be emerging and the investigator begins speculating on the data being scrutinized. Stage 4 is time for judgment. McCracken uses the analogy of coral here. He says that the transcript will now have little bundles of comments

encircling them, creating a reef of information that will require harvesting and winnowing. The surviving data needs to be organized in a hierarchal fashion for final analysis. Stage 5 is a review of Stage 4 findings from each separate interview. The main themes from each interview are compared and contrasted to see how they will fit into a summary for the theses. At this point, the investigator no longer discusses the individual responses but rather in terms of the culture the combination has created. These observations become the conclusions of the study.

**Chapter Summary**

This chapter has reviewed the methodology that will be used in this study. The methodology has evolved over time from a quantitative to a qualitative approach using a connoisseurship or educational criticism design. I have attempted to identify the implications of this type of study, relying on the research finding of Eisner (1991) with reflections from McCracken (1988), Creswell (1994), and the research teams of Easton, McComish and Greenberg (2000), and Frankel and Devers (2000). Connoisseurship or educational criticism is a powerful method. The research findings suggest that there are a variety of ways of implementing my study, and consistent with the theory, informed choices during the process become key factors during analysis and reporting phases of the thesis. "When relatively less is known about a topic, change is rapid, or discovering a new theoretical or substantive knowledge is emphasized, the qualitative researcher may begin with a more exploratory research question and refine it through a series of studies" (Frankel & Devers, 2000, p.4). *The Integration of Educational Technology in the*

*Elementary Years Curriculum* is that exploratory venue, and perhaps just the first in a series of studies.

# Chapter Four

# The Interviews

> *The picture of a classroom with a blackboard, the teacher at the front of the room and a collection of eager, excited learners with an essential homogeneity that ensures collective learning is a nostalgic illusion. Today it is individual needs and the expectation of tailored response that must capture the attention of the successful teacher. A roomful of electronic equipment with which the students often seem more at home than the teacher represents a major challenge.*
>
> (Simmons and Pitman, 1994, p.9)

## An Overview

During the month of December, 2000 invitations were sent to all of the elementary schools in the Fort Garry School Division. Each principal was invited to nominate a staff member to participate in the long interview process as described in Chapter Three. Of the thirteen invitations, there were nine responses from the principals. A letter of invitation was then sent to the nominated teachers and a positive response was received from eight schools.

Brief demographic descriptions of the thirteen schools, to which invitations were sent, were provided in Chapter One and Chapter Three. The schools that accepted the invitation represent the full range of school structures described in Chapter One and Chapter Two. That is to say, there is at least one school each of early years, middle years, French immersion, K-6, and K-9 participating in the study. Four schools did not respond to the invitation and no follow up was planned as it was assumed that the principals chose not to participate in the study.

All interviews were conducted as per the description provided in the methodology. The interviews took place during the months of January and February 2001, and they were arranged at the convenience of the participant, some occurring before classes in the morning, some during the day during release time, and some after school, and all were at the participants' work site. The school principals nominated the participants utilizing the prescribed criteria, "...a teacher who is acknowledged as being someone who is comfortable in the use of educational technology or who is a member of the school's technology leadership team." This was not a random selection process and so it would not be appropriate to make strong arguments suggesting that this is a representative group. However, I have included a table of information about the teachers, to highlight the feature that almost all grades from K-6 were represented.

This range of grade experience provided for a better than anticipated group to study. The experiences described by the participating teachers and reported in greater detail later in this chapter demonstrated that the integration of educational technology can and does work effectively in all elementary grades. In addition to the grade levels, the group included one middle years teacher and one K-6 specialist, who will not be described in any other way so as to protect my promise of maintaining their anonymity.

| Teacher: | Grade: | Years: |
|---|---|---|
| A | 1 | 4 |
| B | 2 | 4 |
| C | 3 | 13 |
| D | 4 | 4 |
| E | 5 | 10 |
| F | 6 | 10 |
| G | K-6 | 16 |
| H | 7 | 16 |

Table 4.1

There was a wide range of years in teaching experience amongst the participants. Some of the teachers had as few as four years teaching in the classroom and others with as many as sixteen years experience. The eight participants averaged 9.6 years of full-time teaching experience. The group included six female and two male participants.

**Participant Profiles**

As indicated by Table 4.1, I will describe briefly backgrounds of the participants. Teacher A is a Grade one, classroom teacher. She has been teaching a total of four years; however only the last two have been in the Fort Garry School Division. She began her career in the *Division Scolaire Franco Manitoban # 49* and is currently teaching French Immersion. She has a computer at home with an Internet connection. Teacher A utilizes this computer for school activities ranging from preparing lessons and activities, doing research and preparing student assessment and reports. She added that with a computer on her desk at school "I am able to do much more at school now!" She also has two other computers without Internet connection for student use.

Teacher B has taught a total of four years in a Grade two classroom in the Division. She described her home computer as an older Windows-based machine. She would like to have a laptop, and currently uses her Internet capable computer at home for banking and shopping. She explained, "I do not do school work on it, because I had *Word* on it and I do not have it anymore." Through an extended conversation it was discovered if *Word* was available at home she would do school preparations there. Although a relative newcomer, she has been recognized by her colleagues as a

frontrunner in use of technology in reporting student achievement via computerized report cards. She has one computer in the classroom, which is primarily for teacher use, but her students do use it daily to access information like current weather conditions.

Teacher C has worked at the same school for thirteen years and is currently assigned Grade 3, although he has also taught Grade 4 and a combined age group class. Teacher C has a computer on his desk and is in the process of hooking up a web mini-cam, a gift from a parent. Teacher C "...removed the one student classroom computer, it was not productive, kids gathered around...". He also has an older home computer with a high-speed connection that is used for personal as well as school based activities. He mentioned that he spent a weekend developing a class home page. He claims to have spent several hours learning the software package, *Netscape Composer*.

Teacher D has had substitute and term teaching experience in addition to her four years full time experience in two different schools in the Division. Although she does not have a computer on her desk, she does have access to a small pod of computers shared by her grade level. These networked and Internet ready computers serve student needs, including special needs programming. Teacher 4 said she has an older (386) computer at home that is used to prepare university papers and assignments. It is too slow and old to consider for Internet and/or other demanding programs and applications, but still serves a purpose as a word processor and is used to prepare class materials, tests and other such activities.

Teacher E has ten years experience in the Division. She began in a term position that included release time for teaching "computers" to students as young as kindergarten. She currently teaches a Grade 5 class. Teacher E has a connected computer on her desk with a laser printer in the classroom and the good fortune of having the school lab adjacent to her teaching station. She has an older computer at home, one she described as, " a boat anchor, it's a 486. ...connected, disconnected – we hook it up through *Escape* in the summer for email." During an extended conversation, she said that she would like to get a laptop because of the flexibility it offers, especially when combined with the docking station feature now available through the Divisional supplier.

Teacher F has worked in the Division for over twenty years and has accumulated ten years experience in various grade levels. She is now teaching Grade 6, but she is in the first year at her present school. She has a Master's Degree in Educational Technology. The classroom computer is readily accessible to her students and she uses it to complete administrative tasks such as report cards, email, and Internet research. Teacher F is the only participant that indicated the availability of two computers at home, both of them more current than any of the other participants. Both computers are Pentiums, the newest being recently purchased through the employee payroll deduction program. She was the only participant interviewed who was enrolled in the employee purchase program. This program allows an employee to purchase a computer with twelve equal payroll deductions, at tender cost, interest free. "The vast majority of my prep is done at home. I use *Word* for tests, Internet for research, creating lessons plans...

I tend to pull things off the "Net" and email them to myself. I keep three separate [email] accounts so that I know where I'm sending material all the time...".

Teacher G is a teacher librarian with sixteen years experience and she has contact with teachers and students at all grade levels. The library is a center of resource-based learning and so she has a small pod of networked and Internet ready computers available for staff, students, and her. She has an older computer at home. It is Internet connected, however it is a Mac and not compatible with Divisional software programs. "My next computer will be an IBM", she added.

Teacher H is not an elementary teacher; however, he is the elementary team leader with responsibility for assisting teachers in the elementary years. All of his sixteen years teaching have been outside of the elementary grades. He is also actively pursuing studies in the field of educational technology and uses his home computer, "Extensively! Primarily for school and my own research." His classroom is well equipped, but set up more for middle years than elementary so I will not dwell on the set up. As he said, "It is not indicative of a normal elementary classroom", which would have just one teacher designated unit. His opinion on this arrangement appears to be the norm throughout the division, based on my discussions with other participants.

**Question/Response**

It is my plan to analyze the Part II interview questions one at a time, compiling the general ideas and understandings of all the participants in an attempt to find common themes and variations in the beliefs of the group members. It should be noted at this time that all participants were provided with the questions in advance. This was done to allow them the opportunity to prepare their responses and gather their thoughts. The value of this strategy is evident in the participant responses to the question dealing with the definition of "educational technology". In retrospect, offering some questions to reflect on, and some for immediate feedback might have been a better strategy. In an attempt to protect and preserve anonymity, I have randomly re-assigned letter identification to the participants for Part II questions.

**Question 1: What is your definition of "educational technology"?**

As noted in Chapter 1, the task was to determine a common understanding of the key term "educational technology". I will admit to a bias and or presumption at this point. I expected the participants to say it was computers or something along that line. Ironically, I was surprised to discover that the only nominated member who saw it that way was the teacher who after being nominated decided not to participate in the study, citing as a reason they did not believe they had anything to offer in the area of computers in the classroom.

The Association for Educational Communications and Technology (AECT) describes **educational/instructional technology** as "... the theory and practice of design,

development utilization, management and evaluation of processes and resources for learning." It is important to note the interchangeability of terminology here. The terms "educational technology" and "instructional technology" are often considered to be equivalent" (Plomp and Ely, 1996, p.18). This is the understanding that I gleaned from responses to my question, although not always as eloquently or thoroughly stated. It is possible that with the advance knowledge of the questions, participants may have done a little preparatory research on this question. Teacher G admitted, "When I saw the question, I normally look up words in the dictionary to see if I've grown up knowing the right term," and although she didn't do it with this one, this teacher went on to say that she believed her colleagues would likely say it is "just using the computer." "I know that's what I've always thought, but since being here I know there is a lot more to it." This teacher then went on to reflect on some examples of educational technology, including audio, the use of a listening station; visual, the use of the camera; and communication, with a telephone in each classroom. Other participants shared similar beliefs. Teacher B thought I might "get a variety of responses that would probably be on the spot or off the cuff." The tone of this conversation suggested to me that some teachers might not have a complete or thorough understanding of the potential for educational technology. Teacher F identified teachers that do not associate with educational technology for a number of reasons. "They avoid computers... They have a fear of computers, they have a fear of designing web pages." At the other end of the spectrum, Teacher E presented a humbler notion, "I think we have a staff where the use of technology is definitely there and I am not the expert. I have other people here that I go to."

Hlynka and Belland (1991) clarify a common perception that technology is more than just tools. "Technology does not merely represent a set of devices that teachers may choose to use, but more importantly advances a world-view that shapes social existence" (p.17). The interview participants did not always make this clear distinction on the initial question. Participant A said educational technology "means using technology as a learning tool for students." Teacher F said, "In my class it means helping the children become comfortable with computers and giving them the tools to get a grasp of the future."

Some of the participants did not use tools as part of their initial response, and, instead, focused on the culture. Teacher D talked about "Using technology to implement ... curriculum, not teaching technology in isolation. It's not computer science, it's using that technology to implement all programs that run with the Grade __ program." Teacher C was very clear on this point, "It's more than tools, I think it is a very powerful way of sharing learning, communicating learning, pulling out resources...", and it requires a different role for the teacher. "The teacher has to be willing to add another dimension to planning." Perhaps the broadest definition, and most reflective of a learning culture came from Teacher B. "Allowing students to express their various intelligences; the most effective, efficient, less stressful and most dynamic way that they can, without becoming dependent upon it, exclusive to other learning styles."

A few participants blended the idea of tools and styles. Teacher E identified a few tools and then talked about a new culture in the classroom. "I think that the computer and the Internet access allows you to teach in a broader way because you do not have to be an expert. The experts are out there, you just have to tap into them." Teacher H, too, combined tools and a technology culture. It "... means to learn, explore, represent, write or read through technology and by technology. That could be computers, Smart Board, calculators, the projector, television and VCR."

As discussed in Chapter 3, the sole Manitoba Education and Training document dealing with educational technology is the *Technology as a Foundation Skill* (1998) (TFS) paper. As this is the provincial directive, I was interested to hear from the participants how it was received in their schools. There was, indeed, a range of response to this sub question, after the definitions had been given to the term educational technology. It appears that, in general, the document has not received wide spread attention. Teacher C had likely spent the greatest amount of time analyzing the document and had even written reflections on the paper through university course work. On the other hand, Teacher H mentioned, "I probably saw it", and Teacher B had not seen *TFS* or believed that it had not been circulated in the school. Teacher F had looked at the provincial directive and answered, "I kind of have my own document in my head. I think my document is either on par or ahead of that document...". In another situation, Teacher A mentioned, "No, lots of people haven't even looked at it, I'm sure." The comments presented suggest that the Manitoba Education and Training document has not

had a major impact on these technology leaders or the schools in which they teach. Further comment on this topic will be reserved as a recommendation in Chapter 6.

**Question 2: When were you first aware that you were integrating educational technology as part of your teaching repertoire?**

This question was included, because I hoped to see some personal reflection by the participants on their teaching careers, especially as it applied to educational technology. This question also served to verify the understanding of the definition of educational technology supplied in question 1. As the reader will note, the participants have been conscious users of "educational technology" for most of their teaching careers. In identifying the time when participants first started using technology, they usually came up with a trigger, an incentive, a support, or a rationale for approaching teaching in the classroom using educational/informational technology.

Teacher H believes that it has been a style she has been comfortable with from the beginning, that it did not become part of her repertoire as she matured as a teacher. She explained, " As soon as I started teaching I was aware that I was integrating educational technology as part of my teaching repertoire. For instance, I would present a documentary on film to students, or show them transparencies using the projector." When asked to explain factors that may have had an impact on her teaching style she was quick to note parental influence and specific teacher models. "Since I was in high school and university I knew we had to learn to type and my father forced me to take typing lessons, because it was the way of the future. At university we were talking more and

more about how schools were using technology and computers." Teacher H was able to make connections to technology through keyboarding skills, use of computers, and a variety of projectors. When pressed for details about how she learned this approach, she mentioned some was "self-taught" and some through media technology courses. However, she again returned to the idea of teacher modeling, "I think basically it came from the teachers that were there, that's what I presumed."

Teacher G described her first year of teaching as an opportunity just to get her feet wet and not to experiment in any detailed way with technology. "I don't think in my first year I did any ... I relied on my prior experiences." As she gained confidence and experience in the classroom with the basics she began to add educational/informational technology to her repertoire. "I started using these just to make it more exciting or just a different way to teach." Teacher G reflected on her growth as a teacher when she stated that, "not necessarily that it offered something that I didn't in terms of what they (the students) were going to learn, but a different way of learning it." The greatest influence on the teacher in learning and adapting teaching strategies came about as a result of being in a strong team situation. "Watching others, ... just seeing how other people were using technology. Professional development was probably not as important as was the concept of team." Throughout the conversation, Teacher G remained consistent with the broader sense of technology, citing several types of tools as well as noting the teaching culture associated with technology.

Teacher F noted that he had been involved for several years, "I have been pushing computers in the classroom for at least 8 years." Teacher F thought that the strongest influence on his use of technology was the people with whom he had worked. He mentioned, in particular, one individual who helped reduce and remove practical problems associated with the use of computers, things like eyestrain and screen-induced headaches. As a teacher he has been "self taught" with the help of others. In this sense he has followed a self-directed plan to learn on a need-to-know basis. In discussing the Divisional technology support personnel, he said, "I'll sit down and say, 'Okay, I have to do something, can you help me please.' Then I'll get those techs out, sit with them for an hour, if I can, and I'll get them to teach me something. Plus I go to inservices, every SAG is always computers for sure, never anything else but computers." Teacher F is interested in future professional development activities and is willing to take more short term "courses". His interest is in "a day or two, practical hands-on courses... It would be nice to do them with the Division's endorsement, because I can't afford to do them and pay for them." When queried about the Division's ongoing technology training seminars, this teacher was not as interested. "A lot of them are long commitments, over 5 weeks – I would rather get a whole day, get it done... Also, it's *PowerPoint* etc. I don't really want those."

Teacher E said that she thinks she has been using educational technology since she first began teaching. "I must have had assignments that required a computer to complete, not just paper and pencil tasks. ...it wasn't just simple word processing, but we used graphing – just teaching math in a different way and having them produce

something and manipulate using technology because it was actually easier." When she considered the factors that affected her use of technology, she dwelt on two areas. The first was essentially a survival skill. It was framed in the sense one needs to be prepared; "you need to experiment before going to the lab with your kids." She did some self-teaching, learning for herself where the surprises and the difficulties lie. As an anecdote she said that even with "...a good set of instructions I had 26 kids wondering what they were doing." Teacher E recognized that teaching with technology involves a new "culture in the classroom". This new culture includes one where kids may know more than the teacher and have more skills. "My kids also come with background knowledge about topics because they are watching Discovery Channel programs. Those types of programs mean that teachers no longer 'know it all'... you are right, you know that and I don't and that's okay." When it comes to her learning, Teacher E has not had many formal courses or seminars. She has, however, taken advantage of informal staff mentor situations to gain knowledge and understanding. "I've sought out people to help me learn." This seeking of knowledge has included other technology leaders, teachers and even friends outside of the teaching profession. "He may not know what I am specifically doing, he'll know how to get me out of a problem because he has the technology knowledge of a computer," and she added, "...that I won't make it blow up!"

Teacher D began her teaching career in "charge of computers." She went on to explain that her first experience was teaching about computers back in the early days of the Apple II computers. In retrospect, most of us had to teach parts and functions because at that time it was all brand new. "The first time I really used it, where it would

be educational technology, was when I taught Kindergarten. I sat down with the book and made up a template for an alphabet book. ... Getting them to learn something rather than teaching them how to use a mouse." Teacher D noted the accomplishments of her students as a reason for pursuing educational technology as a teaching style. "To see all the neat things that engaged them and got them going, they were learning to use the computer through osmosis by doing all those other neat programs – start, stop, erase, and all the rest of it. The kids really got into it, it gives your curriculum a different focus, a boost." "Right now they are writing life stories on their parents, and they are word processing on the computer. There is no rough copy or a million pages that they are getting lost or trying to edit something on a piece of paper where there isn't any room." Like many of her colleagues, Teacher D has not taken any formal courses. As she suggests, "It's sitting down with someone who knows how to do it and having them help me. If I see a purpose for it, I will figure it out. ...I have learned a lot more from other people." She citied examples of great workshops offered by teachers outside her school division that have led to interesting classroom and enrichment projects involving *PowerPoint* and web page construction. Teacher D is also a risk taker as exemplified by her closing statements on this question. "If I see a purpose, I'll persevere and I'm not afraid to click. I always say to staff, don't be afraid, you are not going to break it! – Just try it!"

Teacher C began using technology for a very tangible reason. It was readily available. "When I got the computer in my classroom, and it was right there, physically available and you didn't have to do 'carting the kids to the lab' routine." The interest,

however, grew for a different reason than most of the other stated reasons. She began to experiment with the computer when she purchased one for home use. "I knew that as a parent this was part of the kids' future. ... I just knew that if I was going to be an educator, I had to learn it." Availability of resources, including software, was important initially. "We seemed to be able to buy a lot of software, so I had a wide variety. It was engaging for kids, with a wide variety of ways to use it." Teacher C has also been primarily self-taught. She had the opportunity to attend the TIES (Technology Information Education Services) Conference in Minneapolis twice and that has had an immense impact on her teaching. "At TIES, it's teachers, teaching teachers, they show you what kids did back in North Dakota, you can see product, and you talk about process." Teacher C also talked about teacher support groups that evolved from Divisional technology initiatives, projects that included networking with other classroom practitioners beyond the local boundaries.

Teacher B is another person who has always used technology in teaching. "I've never stopped." The rationale for teaching with technology is very much a research-based belief, summarized by, "It's really important [for me] to know, in order to meet the particular needs of the students, what is the current liability that we can turn into an asset. I found that with the majority of students that are not linguistically based, in terms of paper and pen, put them in front of a computer and that memory block is gone. They will fill screen after screen. Those are also the students, I don't think coincidentally, that are very tactile oriented that like to build, make and take apart. They are also the very spatial students as well." When asked about the triggers that helped maintain this high energy

and interest in technology, Teacher B was very clear, "Number one would be my own interest, without that, it wouldn't matter. The second would be the support given by our current administration at the school level and most definitely the support at the admin office level. We are all aware of the spin off benefits; ... it's to get people in the loop and stay in the loop. I think that's why they are really promoting it because they see this as a real vehicle to get other people moving."

Teacher A says she has been using forms of educational technology for approximately six years. "The computer tends to be used as a center... it's just another medium that we use." Teacher A has seen the evolution of software applications from CD ROM to school based networks to finally the Internet.

**Question 3: Could you please describe for me a significant activity for you and/or your class that involved the integration of educational technology?**

Question three was included to collect a variety of activities that could be used to showcase and celebrate the success the teachers in Fort Garry School Division have had with the integration of educational technology in the elementary years. Remembering back to Chapter 1, there were those who believed very little was occurring in this area. These examples, expressed by eight technology leaders, are a small sampling of what has already been done and ways that they have been done in the Fort Garry School Division. These samples start to reveal the reality that for these teachers, educational technology today does focus on the use of computers in the classroom.

Teacher A reflected on a Grade 1 research project on Space taught last year. (1999-2000) "There were some very bright students researching space, and I taught them how to use *PowerPoint* to present their information." The reflection went on to identify a few salient points. The first was the software selection. Up to this point the Division had made a conscious decision to use *Hyperstudio* as the elementary years presentation software package. "I started using *Hyperstudio*, but it is too difficult, I was impressed with the fact that I could teach Grade 1 to use *PowerPoint*." She went on to discuss software and the urge to purchase newer and better packages. "Some people aren't aware of what there is, and we have a lot of it in our library. People think more is better, but we have plenty. People need more time to be trained and to learn." In addition to this teaching scenario, Teacher A also discussed the success of the administrative use of email in the Division. "...Email is very efficient, for example when something comes across my desk I can send it to everyone fast... Email is great when speaking to other schools." In spite of these strengths she was also cautious because of the loss of "bringing people together in face-to-face meetings", as a result of electronic messaging.

Teacher B does not actually teach in an elementary class, and, as a result, he spoke in general terms. "I think what's really exciting is the elementary teachers know that there is a teacher/technician that's available. They are asking me to come into Grade 3-6 to work with students." The work may be in research or presentation software. The teacher does see how this impacts on older students. "The point now is that virtually all assignments are handed in electronically," referring to one group of older children in one specific class. The growth and development is perhaps more obvious in his school.

Noting the progression, "So there is a transition from *PowerPoint* to discovering hyperlinks, to embryonic web page, to now full-fledged web page design in Grade 8."

Teacher C was quick to respond to the question with a major activity that has been showcased in the Division and reported by the newspapers as a major success story. Her students were involved in doing community research and sharing it with students via the Internet in other schools around the province. Factors that contributed to the success of this project will be discussed in Chapter 5. In brief, she mentioned that the preparation time that was provided to meet with team leaders in other schools to coordinate the project was critical. She was able to develop skills and strategies that worked with the students in her classroom. "We got very generous release time to work together. That's what drove it. If it had been offered to try in a class [without any supports] it probably would have been filed. ... We could work as teams, we could meet during the day, and we could work through our technical glitches with expertise from the Board Office when we needed it... We didn't have to do it all on our own time. ... There wasn't the constant frustration of having to work 7-11 at night on your own computer."

Teacher D talked about an enrichment project that crossed grade levels. She talked about working with a small group of students. In her case they had to go to the Board office to access a scanner and *PowerPoint*. The students worked on a variety of projects depending on their own interest. "It was amazing, I would show them one little thing and they were off and running, they would figure out ten other things. They would tell each other." The students became comfortable using a digital camera, "for things like

their artwork" and imported images into their presentation. "That is a skill that all students, not just the enrichment group became comfortable with." Teacher D was so pleased with the success of this project that she has incorporated a "digital portfolio" project as a priority in her professional growth plan, so she can extend it to all her students. Like teacher A, she is happy to have found appropriate replacement software for *Hyperstudio*.

*Charlie and the Chocolate Factory*, by Roald Dahl, is a popular elementary years story. While her students were reading the book, Teacher E worked cooperatively with a colleague to develop a theme lesson on chocolate. Together they developed a unit that integrated technology with the traditional print version. "I could take my kids down to the lab and we could go on a virtual tour of the Hershey's Chocolate Factory. It was great because we were reading a book about chocolate and we were discovering what chocolate was made of, all about the cocoa plant. The kids could actually see these things and see what it was like to go to a chocolate factory." This also had a positive effect on her own professional development. "After that experience I took a computer course so that I could learn more. ...Creating your own website and doing a whole bunch of things with technology that I haven't done before."

Teacher F reported on a current class project - a class homepage. He was in the process of having each student post pages of their writing and artwork. He designed the homepage "so that it looks professional. Their (the students) work is on the subsequent

pages." His students are learning to keyboard, word process, scan; and the teacher hopes to add webpage animation, time and resources permitting.

Teacher G listed a variety of activities rather than focus on just one thing. "I use my tape deck with the headphones. The kids use them everyday at the centers. We use the computer in the lab to make calendars. We do research – in some areas; I get the kids to use the Internet. My kids look up the temperature everyday on the computer and off the telephone as well. I use listening centers all the time." In discussing her role as a teacher in these types of activities she said, "I teach them how to find the answers."

Teacher H identified projects her students had done. The first involved the children studying bears and utilizing a CD ROM to enhance and enrich their learning. The interactive CD ROM program was designed to support reading and comprehension. A second project involved students doing word processing. They wrote letters and did some desktop publishing. "Every child had their own letter to (name) and their own letter for (another name). ...We thought we would create a sort of collection book with all the students' letters. Once they were done typing their letter, they would go into the paint section, under KidWorks2, and do representation of a (thing)". The students are also involved in another letter writing exercise using Kidswork2; this one will be a thank you note. The teacher, like another one of her colleagues interviewed, prefers that the children use the computer. "I find it easier to do it on the computer because as soon as the child is done writing I can simply correct it with the child. So he/she gets immediate feedback in terms of his/her errors and then we print it right away. Where as the old way

they would write, it would be a rough draft, the teacher would correct it with a pen, give it back to the child. The child would re-write it all over again and there might still be mistakes on a new copy."

**Question 4: The editor of a distinguished educational journal has just invited you to submit an essay on your use of educational technology in the classroom. What is the title of your article and what are the key points for discussion?**

Question 4 was designed to elicit critical issues. The topics would be so important, that one might wan to write about it. In spite of the advance notice given and the opportunity provided to prepare, this was the one question all participants reported having difficulty with. This is reflected in the fact that this section also carries the shortest answers, and even with the answers provided there is the tone of doubt and uncertainty. This is represented in comments like, "I probably would..." or "That was kind of hard because..." and "I don't have all the answers, but...". I was disappointed, initially, with the recorded responses, and yet, as I started to look carefully at them, a pattern began to emerge.

Teacher H had two possible titles. One that caught my attention and represented her ideas was *Essential Tools for Schools.* The article would include at least three main points: a definition of educational technology, a description of how technology is used in schools, and how it is integrated with themes that the kids are studying. Teacher H had strong arguments to make to parents and the general public. One of those was that children must use computers in support of some curricular topics, like mathematics. This would alleviate the fears that some parents have that children may never learn to do

mental calculations. "The computer does not, and can not, replace entirely the present and old school supplies like a pen, pencil, and paper." In support of these arguments, she would discuss the fact that "...our students will be part of the work force... it is imperative that they learn the essential technology that will help them contribute in the workforce... there are computers everywhere."

Teacher G suggested a title along the lines of *A Call for Ideas*. She was looking for more ways to incorporate educational technology in her daily instruction. Like many teachers, she was interested in, and keen to develop new and exciting ways of presenting the curriculum, but she was looking for starting points that will enable her to become "more comfortable" with the technology. Perhaps rather than a full-fledged article, her selection in the journal might be found in the "Help Wanted" section.

Teacher F would report on a project that he is developing. It would discuss the power of a future teachers' website, one he will title www.myta.ca . Teacher F recognizes the frustration that is developing as a result of too much information on the Internet and is attempting to design search engines that will provide valuable resources to teachers and students. He believes "myta.ca" will help. "The Internet is a mess of information, it has become bogged down. I am trying to solve that problem! ... My website would be practical for teachers ...it will actually be a search engine."

Teacher E suggested something like, *Teacher, Teach Thyself*, although it was never clearly stated as such. She suggested that "...teachers need more education in the

area of technology." A concern she had was that "...kids are far beyond the teachers in the classroom in terms of their specific technology experience." She wants the teachers to get better at combining their teaching styles with computer-based activities. "It can be a hard step to make because it does take some time outside of work ... just to teach yourself. ...What's more time consuming than the marking is teaching yourself what you need to teach the kids."

Teacher D titled her article *Integrated Technology*. She would like to show "...how easy it is to implement your curriculum using the technology as a tool to help you. Tools to implement effective teaching, so that you can use the technology to build on the things you are supposed to teach anyway – not trying to find an extra hour to teach word processing."

Teacher C would write an article about a teacher mentor program. She described a project that she is currently working on where she is mentoring a colleague, someone who "...has never attempted anything that truly integrates technology before. It has been really good, it's been two heads together." The article would be about the do's and don'ts. "If you don't anticipate problems, and don't think you can deal with them, then don't bother. It would be like a pep talk – don't do this, if you have little patience; don't do this, if you like working alone; don't do this, if you have to know what is going to happen next. The part that I like the best is that the projects you do with the kids take on a life of their own. The kids take them away from you, I personally love that, but if you are a teacher who feels threatened by giving control to the kids, don't go there." In

analyzing the rationale for the article, and the success of the program, Teacher C noted, "At this point, I know more than she does, (referring to her mentor partner) so I'm teaching her and the kids at the same time. I stayed at (my last school) long enough to see the ripple effect. I personally find that extremely satisfying, to see the mentorship just keep going and going."

Teacher B lays down the gauntlet in *It's Passed Time*. He wondered why those teachers who have a lot of the equipment and software in their rooms are using it in such a limited way? An additional challenge he noted was a personal one, to change the learning/teaching paradigm, "Admit that you don't know everything about it and let the students teach you and teach themselves, it's supposed to be collegial learning." On a personal note he said, "I have learned more in the last four years from the students than I ever would from taking a course because of the multi-complexity of what we are doing."

Teacher A suggested *Collaborating in a School to Use Technology Effectively*. She went on to distinguish between training and professional development. She defined "Training as being able to use a specific piece of software and professional development as knowing how meaningfully integrated technology in the curriculum area. Not just use it as extra games or as an electronic babysitter of the kids. Really making some meaningful use of it." She saw a role for the Divisional Technology Leaders Committee in this area. In recent years it seemed that more and more time was being used to resolve software and software glitches and Teacher A thought this group could spend more time discussing pedagogical issues, "I wish there was more time to share and to discuss ideas."

**Question 5: How can we as individuals, school staffs or a division cause more integration of educational technology to occur in our classroom/schools?**

This question of course carries with it a major bias, and that bias is at the heart of the thesis. I believe that the effective use of educational technology in the class will enhance teaching and students' learning, and that is why we want more of it to happen. This was my key interview question; the one that I thought would represent the personal opinions of the recognized technology leaders. The responses represent practical ideas; they are truths as understood by the individuals who presented them. Some of the ideas are woven into earlier questions; some of the participants extended the ideas into question six. Whatever the case, the following represented the ideas of the eight participants.

Teacher A made a strong argument for the appropriate tasking of existing staff. Fort Garry School Division has experienced budget reductions in recent years, and it has had an impact on technology. In some schools the .1 full time equivalent staff person responsible for technology was cut at the end of the 1999-2000 school year. In other schools, the role of the teacher/librarian was reduced. Both these categories supported the resource-based learning that is integral to information/education technology. "I guess I would hope that teachers get the message in their schools. They should use their technology support person in their unit planning." Teacher A also saw a role for staff training and professional development programs. "We do need training in some areas, but sometimes just reading an article about how someone successfully used technology as a part of a social studies unit. More sharing should be going on. Maybe more meetings at the Divisional level where teachers share how they integrated technology into a certain

subject area." These are practical suggestions on how we can improve and/or increase educational technology in the schools.

Teacher B had a very brief succinct message. It involved modeling a program in place in Grand Forks, North Dakota. A divisional Committee was exposed to the plan through a presentation made last spring. The presentation focused on the findings of a doctoral thesis done by Pamela Carlson (1997) and submitted to the University of North Dakota. He said, "We really need a permanent on-site teacher/technologist. That is the common thread of concern that I hear each year from virtually every teacher new to technology. Unless we go to the next step, meaning culture, familiarity, and comfort, we are breeding contempt. Teachers are tuning out!"

Teacher C was also brief and to the point. "We need people, we need time! We need people first, because when they are excited about something they'll give up their own time. We need people to teach people."

Teacher D had a bright positive picture of what is happening inside the Division and would like to see us celebrate our successes. "It's the age old question, it's not just technology it's what's best in your classroom and how do you share that with everybody else. We could, I guess, use more time for visitations, we need a network – maybe on the divisional web-site, an integration site where you can go and get new technology to supplement your curriculum." As a method, she supported the positive approach. This suggests a learning style that will be discussed in Chapter 5. "This is going to make your

life easier, better. This is going to get your kids interested. There are always the few people who resist change or aren't as open to something or see it as one more thing they have to figure out in order to do their job, it's just easier to do on paper, because you already know how to do that. I always approach it from the direction of this will make your life easier. When I taught them all how to do the computerized report cards, I told them it was fabulous. Once people did them they did comment that next time it would be easier. When I saw one of our teachers who literally couldn't turn the machine on, teaching another teacher who is actually quite computer literate, I thought I could die a happy woman tomorrow. This person taught that person something about computers. If you make it relevant to their situation I guess then they become interested and involved."

Teacher E's comments focused on professional development. "In order for teachers to take a step forward [workshops] have to be offered in a time where it is not always above and beyond what they're already doing. That it is either a specific time set during the school day, so that people who have families can actually do this. It's a big expectation to require teachers to go home and learn it all on their own time. They want to go home to spend time with their families. As educators we want the parents of our students to spend time with their kids, so as teachers we have to remember to spend time with our kids too. I don't have any, but I look around.... So, for some of these things to happen it has to happen within the workday. I think that it shouldn't be something that teachers feel has been pushed on them and it has to be positive." Like her colleagues Teacher E recognizes a leadership role and a new culture, a changed paradigm.

Teacher F identified human resources and staff development as a combined need. He related his suggestion to what he knows about a model used in a school in another school division in Winnipeg. "Greenway School is a fantastic model for really getting a lot of things done on the computer with a full-time computer teacher. [The teacher] handles every class just like music and/or physical education specialist would. ...Our lab [in the Fort Garry School Division] is still sitting empty. Short of forcing us down there, that lab is not being used enough. The way I see it, some teachers need further training, or do not have enough time to go down there and do a really big project. You need to have a teacher down there ready for the class with a special project; she'll spend an hour and half with a certain group. If the students are there (e.g.) every Day 3, gradually the kids' strengths build in whatever they have been working on."

Teacher G believes she needs more classroom-based resources. "I find that I don't have a lot of software on the computer in my classroom. I would need software." In addition to software she also identified a problem with sufficient hardware. "It's just frustrating because there are two children to a computer. (reference to the lab) There just isn't enough time. Also, I would suggest more computers in the classroom, although I don't have the space for it. I would need a couple of computers to get more than one child through on a program." The third item she identified was inservicing on the use of both afore mentioned items, hardware and software.

Teacher H began with the wide-open suggestion, "We need money, lots of money...!" Some of her initial ideas will indeed require an infusion of funds. "My

vision would be that I can use my computer and hook it up to the smart board projector and the students can see and follow what's going on here in the classroom instead of always going to the lab downstairs." The technology classroom will need special considerations too; it will have to be bigger to accommodate student workspace. "Every student would have a computer at his/her desk. I think that probably a laptop would be even better... but without cables. So, once they are done with the laptop they could close it up and put it in their desk. They still need that writing space." Teacher H's vision also requires a paradigm shift. To meet the changing classroom culture, we "would send teachers to seminars ... We shouldn't be afraid to use the PD days to help teachers feel more familiar with computers." In the future this might become part of a Divisional hiring strategy. "We would integrate more educational technology with mandatory expectations that all teachers and potential teachers applying for positions in a school must have knowledge and experience with computers. I find that the younger teachers are more at ease with computers. They are growing up with them." Another item from Teacher H is the allocation of appropriate software for the early years program. "I find that this year, more and more we are having things for the younger ones." Moving away from money items Teacher H also suggested some public relations activities. "I think it would be nice to have a computer night. The kids could be at the computers and show their parents what is going on with computers."

**Question 6: Are there any issues or concerns regarding the integration of educational technology in the elementary classroom that you wish to add?**

The last question is the catch all, permitting the participants an opportunity to bring forward any personal issues and/or concerns that may not have been addressed in our early conversations. Teachers D, E, G, and H had no further comment at this stage of the interview process, others had comments that were in some cases within the context of this study and in other cases they were not.

Teacher A had some excellent questions. The first, is, in fact, an assumption made by the author. "Is student learning really improved by using technology?" Secondly, "I wonder if schools should be addressing the equity issue?" Neither of these questions will be addressed in this paper as they extend beyond the scope of this thesis. Her third concern was a statement that is important to this thesis and will be addressed in Chapter 6. "I would like to be able to sit and talk like this. (the interview process) Nobody has time to talk about the real issues." The question that arises is how can we as a group of teachers create that time?

Teacher B dwelt on an educational culture that he believed will be required to allow more educational technology to occur. The response is perhaps better dealt with in the context of question 5. For the record, he says, "...that when teachers are using technology let go of control, minimize control. The more control you try to exert, the less control you'll have, the more your fear increases. Become part of the student's project. Understand why they are doing it the way they are. Why they want to do it their way. Do not focus on the product itself, rather the process of learning."

Teacher C referred to her "wish list". She was looking for solid research that would direct us to consider either "putting money into labs or take them all apart and stick computers into the classrooms again." She wished for technology plans that weren't so difficult and time consuming to create. She wished we could create a plan that everyone would buy into that saw kids learn to keyboard effectively based on their grade level. She wished we had a mentor program like the one in North Dakota, investing in staff development.

Teacher F also wanted to see a specialist computer teacher. "I think that we really have to have access to the techs. ... To have a tech in every school, ... willing (and able) to do some serious teaching, not to students, but to teachers. ...It doesn't take much to dissuade a teacher, a good teacher, from using computers."

**Chapter Summary**

These ideas represented the vision, the dreams and aspirations of a small select group of teachers. The comments are based on their experience in the classrooms of the Fort Garry School Division in Winnipeg, Manitoba, Canada. The next step is to take a closer look at this list of comments and analyze their content as it applies to the thesis questions outlined in Chapter One.

# Chapter 5

## A Reflection on the Questions

*Theories do not always betray their origins, nor do they always anticipate their fates.*
(Gardner, 1993, p. xii)

### Introduction

As noted in Chapter 3, there were three research questions:

1. How do the educational technology leaders in the elementary years define educational technology?
2. What are some of the significant stories/experiences that technology leaders talk about: a) when they first started integrating technology into their teaching; b) and, how they are integrating technology now?
3. What issues, concerns and recommendations have the educational technology leaders identified as critical to the integration of educational technology in the elementary years?

It is my intention to reflect on these questions, or according to McCracken (1988), to "winnow the data" (p.19) through the postmodern condition as described by Hlynka (1995) and Doll (1993, 1993a). Hlynka (1995) noted six features: breakup of the canon, multiple voicing, non-linearity, ironic juxtaposition, supplement, and slippery signified. Doll (1993, 1993a) considers the four "post-modern" R's to be: "rich, recursive, relational and rigorous", and supports an open style of curriculum construction. This full postmodern analysis will only be applied to open the ended questions, numbers 2 and 3.

### Question 1: How do the educational technology leaders in the elementary years define educational technology?

Defining the term educational technology can limit the scope of understanding and restrict opportunity. For, to define a word in a traditional manner, according to Doll (1993a), "is to go against the very spirit of post-modernism; that is, definitions limit and

close rather than generate and open" (p.280). So, it is with caution that I attempt to describe the way technology leaders define educational technology, so as not to limit their collective vision.

The technology leaders in the Fort Garry School Division share the essence of the AECT definition described in Chapter 1. That is, "... the theory and practice of design, development utilization, management and evaluation of processes and resources for learning" (Plomp and Ely, 1996, p.18). And, the extension of this, that, educational technology "...advances a world-view that shapes social existence" (Hlynka & Belland, 1991, p.17). The educational technology leaders embraced these ideas; however, they were not always as clear and succinct in their own words. They described educational technology in three basic ways when asked the specific definition question: 1) as tools, 2) as a way of life, and 3) as tools and a way of life. In this sense they lacked a clinical/textbook definition; still, the lessons and experiences they described through probing questions clearly showed they understand the theoretical definition through their daily practice.

Ely (1995) says, "Computers are ubiquitous" (p.1). The technology leaders suggest it is more than computers, rather the full realm of information technology that has become ubiquitous. There is one anecdote in which I was directly involved that occurred outside of the formal long answer interview process that I believe illustrates this point. During a conversation, I listened as one teacher expressed a comment that I have heard from other colleagues as well. She said, "I do not believe in all that technology stuff."

Like others, she may not have been aware of the understanding the educational technology leaders have of how educational technology has become integral to daily instruction. I explained to her that educational technology included the design, development and utilization of processes and resources to enhance learning; and that, she was making use of educational technology in reaching 620 children and over 50 adults every school day.

I described, how the innovative listening activity she was presenting, involved the effective use of many technologies, technologies that perhaps were being taken for granted. In the postmodern sense, the technology had gradually supplemented traditional aspects of her teaching repertoire. Each morning she addressed the whole school, using a computerized public address system. She then inserted a compact disk into a media player that was synchronized with the public address system and programmed a track of music, for the whole school to hear. In the technology sense, she substituted the original instruments and musicians who had created the masterpiece with a vinyl disk. Children in twenty-three classrooms, have the opportunity to listen to classical music pieces from famous composers like Bach, Mozart and Beethoven, with guidance from a specialist. This type of learning activity was not possible just a few years ago, and a self-proclaimed "Luddite" is providing it.

I use this story to illustrate the point that educational technology has become part of our social fabric; it is a tool, but much more than a tool, it is a way of teaching. The practice has become so well integrated into teaching that it is occurring naturally, at a

subconscious level. The technology leaders recognize this, and have illustrated it with their examples described in Chapter 4. So, in answer to question number one, the educational technology leaders in the Fort Garry School Division live and practice the definition prescribed by AECT and clarified by Belland and Hlynka (1991).

**Question 2: What are some of the significant stories/experiences that technology leaders talk about: a) when they first started integrating technology into their teaching; b) and, how they are integrating technology now?**

There were two distinct themes that evolved from the story telling process. They include: 1) the use of technology hardware, and 2) the integration of technology into the curriculum.

The act of telling stories, as noted in the question, relates to a postmodern ideal. Once the stories are told the experiences related are in effect truths. As readers and or practitioners, we may not agree with the story and its tenets; however, that does not change the fact that the narrator does. This is all part of the multiple voicing described by Hlynka (1995). There is more than one correct answer; there are different aspects to each solution. Doll (1993a) goes on to discuss the richness characteristic, "... to be filled with enough ambiguity, challenge, perturbation to invite the learner to enter into dialogue ..." (p.287).

**The Use of Technology Hardware**

One story that I offer for reflection deals with a participant who mentioned having a computer for student use in the classroom that was removed because it has become a distraction: Too many students wanted to use it. The postmodern multiple voices scream

out. One voice might suggest that one computer was problematic and was leading to confusion, perhaps even chaos in the area of classroom management. The removal of the machine could be construed as a sound judgment based on what we know about controlling student behaviour. A second voice may offer the advice that if one was the problem, perhaps the teacher should have more, to relieve the stress on the computer station. In fact, another educational leader had mentioned the opportunity that was provided to the children when two 486 stand-alone machines were placed in the room. Although they could not access the Internet, they could still do research utilizing encyclopedia CD-ROMS and work on independent learning with tutorial programs.

In the postmodern condition, supplement is the continual adding of resources. In the world of technology, many of the additions have been in the area of computers. When microcomputers were first introduced in the classroom almost twenty years ago, the Apple provided 6 K of memory; programs and data were stored on 5.5" floppy disks through external disk drives. Approximately ten years ago the Windows based 486-megahertz computers were introduced with apparent unlimited hard drive capacity in the sub-gigabyte range. The year 2001 Computer often has upwards of 248 megabytes of RAM and twenty gigabyte hard drives. The increasing capacity of these machines is surpassed almost as soon as they are sold.

The technology leaders share an interesting story when it comes to the use of personal computers. All, but one of them, have antiquated machines in their homes. One leader believed hers to be a 386 computer, and described it as running on an early

Windows system. Another leader referred to her home computer as a "boat anchor". I believe there are a number of perspectives. The first, and most obvious is, how could these people be leaders if they are using such old equipment? The answer, I believe, is a result of their thorough understanding of the uses of technology. The eight teachers who participated in the survey are master teachers: they are experienced professionals, demonstrating qualities of excellence in teaching.

Simmons and Pitman (1994) collected descriptors of excellent teachers from students, parents and fellow colleagues. The study participants demonstrate some or all of the following qualities: flexible, interesting, available, informed, accountable, and relevant. These qualities are what allow the technology leaders, to make the most of what has become readily available and very inexpensive equipment. They continue to see the value of the tools even as newer ones are available. This is not to say, that the leaders do not become excited about, and demand the new multi-media stations, but rather they see the need for that equipment for specific activities, not as a universal requirement. This became evident in special projects like "Building Bridges" (2000) where scanners and cameras were integral to success. Also noted, in another example, was the importance of a CD-Burner. Students are creating 4-5 megabyte digital portfolios and leaving them on local servers. Without the ability to transfer and store these files in a school of 300 or 400 children the server would soon have filled all available hard-drive space. Some specialty equipment and some powerful machines are required to insure the ability to create multimedia presentations; however, there still is a place in the elementary school for older equipment.

Donald Ely (1995) in his paper, *Technology is the Answer! But What Was the Question?* addresses the issue of continually adding to the hardware resources in schools and their escalating costs. In Chapter 2, I discussed the ironic juxtaposition in the Bill Cosby monologue, "Why is there Air?" (circa 1967) Today Ely asks, why are there computers? The irony might appear to be to fill businesses and schools with expensive new equipment. He stresses the point, "When technology makes it possible for people to do something, people do it, not always because it is necessary, but because it is possible" (p.4). I would like to refer to an analogy of the "virtual refrigerator door". Students used to take samples of their work home and it would be posted on the refrigerator in the kitchen. Today, because access is almost universal, students are able to post their work on the World Wide Web for everyone to see. Is this why we have computers? Is this why we teach web design? Is this necessarily a good idea? These questions lead naturally into the discussion of integration of technology into the curriculum.

**The Integration of Technology In the Curriculum**

I believe the technology leaders, through their stories, lean towards postmodern ideals in the use of educational technology. Having made that statement, there is also strong support for a traditional model of curriculum, and so I believe that there are two distinct levels to address. This is where I wish to discuss slippery signified (Hlynka, 1995). Although the technology leaders admitted to limited exposure to *Technology as a Foundation Skill* (*TFS*) document, they all demonstrated a connection to its philosophy as well as its ideals. Although, only one of the leaders has actually read and studied the

*TFS* paper, all the leaders were finding ways of integrating technology into their core subject areas. As *TFS* states, "The information technologies, comprising computers and their peripherals, computer software, the Internet, and electronic multimedia, are becoming part of our daily existence at an ever-increasing rate. This reality also informs the need to integrate information technology into the curricula for the various subject areas" (Manitoba Education and Training, 1998, p.1).

The learning experiences shared by the technology leaders could be considered representative of core curriculum activities. Their students are reading, writing letters, studying scientific theory, applying mathematics, investigating communities around the world, and presenting their work, in public. In this sense, the children under their instruction are following the base level subject area curriculum identified in Chapter 2, or the Manitoba Provincial Curriculum. The students are learning facts and figures that can be assessed using standards tests created by Manitoba Education and Training. In Chapter 2, I referred to that as a level one curriculum. It is a Tyler-like closed curriculum where everyone knows the expectations for children at each grade level, and the children are expected to perform to that level. The technology leaders are cognizant of the requirement that the students meet this minimum standard, but see that the students are capable of more.

Doll (1993, 1993a) argues for an open-ended curriculum, but it is my view that the Manitoba curriculum is closed. Doll suggests that if a goal is identified, it limits the desire to experiment and to go beyond expectations - to construct personal knowledge.

The goal expectations may have been established and designed to control student learning, but in the case of the Social Studies curriculum, they were created in 1982, years prior to the advent of resources like the Internet. *TFS*, according to its front panel, was intended as "A resource for curriculum developers, teachers, and administrators", and I see it as providing legitimacy to aspects of a postmodern curriculum. It is potentially an open-ended document, providing the opportunity to move to a level two curriculum. Having said that, aspects of it are also a closed document. It's "Appendix A: The Information Technology Literacy Continuum" (p.17) suggests there are three learning stages that are linked to grade levels. Each of these stages lists various skills that are classified as either 1) exploratory, 2) skill development, or 3) application and extension phases. This is where Doll's (1993a) recursive curriculum feature should be noted. The *TFS* is the only provincial document to date that deals with one of the foundation skills, technology. Its publication may have been premature. Already members of the department are willing to reconsider their original statements on the Technology Literacy Continuum. They have recognized, as a result from feedback in the field, that the skills do not necessarily follow a linear path, or that they are restricted by the stage in which they are placed to a particular grade level.

I will attempt to clarify. A teacher develops a lesson in Grade 4 social studies. In keeping with the provincial curriculum, students select a country and then conduct a research project using guidelines provided by the teacher. In the end, a project is submitted for a grade. The technology leaders told stories that were shaped very much like this; however, the ambiguity of the instruction provided students and teachers with

options to explore. In the case of a classroom where there is the natural integration of educational technology as suggested in *TFS*, students combine a number of research strategies. Strategies ranging from and including books, CD-ROMS, the Internet, in person interviews and telephone and fax contact with real members of the country being studied. As the children are immersed in the project, the teacher guidelines are quickly surpassed and replaced with data collection that exceeds teacher expectations. The final product includes student drawings, maps and text, but is prepared as a PowerPoint or Hyperstudio presentation that includes sound and perhaps even a video clip. The hand-drawn artwork is scanned, digital photographs made and inserted into the word-processed document that included statistical charts from the nation's homepage and maps from the Grolier CD. It is viewed in a public forum with friends and parents present; everyone stands as the nation's national anthem is played via a media file.

The technology leaders had a common belief system. They thought it was important to allow the students the freedom to develop and create their own learning. The educational technology leaders respected the fact that some of their students were more technologically literate than they, and could work beyond the expectations set out in the *TFS* continuum. After all, Information Technology Literacy Continuum skill 1.3.2, "Use information technology to conduct research, share information, and work in collaboration with others" (Manitoba Education and Training, 1998, p.20) is contained in the Application and Extension continuum and is an expectation of senior years students, not grade four. In the postmodern world, non-linearity is one of the features described by Hlynka (1995) and obviously practiced by the technology leaders.

To sum up question two, I believe the educational technology leaders have moved toward a teaching practice that contains elements of automaticity in the integration of information technology. Although still tied to a level one provincial curriculum that relates specifically to the four core subject areas, they embrace the open-ended belief found in the *Technology as a Foundation Skill* document. Technology is an over riding concept that needs to be addressed by all teachers in all subject areas at every grade level. The samples of activities described indicate that students in all elementary grade levels are able to use a variety of educational technologies in preparing assignments and completing projects.

**Question 3: What issues, concerns and recommendations have the educational technology leaders identified as critical to the integration of educational technology in the elementary years?**

Teacher training and professional development brings about many unique concerns, ranging from appropriate and effective implementation strategies to budgetary implications. The technology leaders in this study saw training or skill acquisition as the short-term piece, and professional development being the long-term, life style, and attitudinal adjustment phase. Based on their interviews, I believe the technology leaders are describing a postmodern approach for teacher development. They recommended formalizing a system of collegial support groups, as a means of addressing their own learning needs. This was especially noted in the "Building Bridges Project" where the support groups also included teachers from outside the Fort Garry School Division. Carvin's (1999) position is similar. He states, "Teachers have not been exposed to

constructivist teaching styles or community-building professional development opportunities among their peers. In order for teachers to embrace the Internet effectively, they must be given opportunities to experiment and explore, to interact with each other, to learn the benefits of collaboration" (p.3).

Carlson (1997) says, "Technology can serve as a vehicle for significantly changing what happens in classrooms and diversifies how and what students learn" (p.24). The use of the information technology described by the participants in this study suggests a particular style of learning/teaching. The projects mentioned carry a student-centered focus or a constructivist view of learning. Traditionalists, like Jean Piaget (1959) were among the first to describe the constructivist theory. He suggests that we acquire knowledge by constructing it from the inside based on interaction with the environment. The "Multiple Intelligence Theory" embraced by Manitoba Education and Training and prescribed by Gardner, (1993) also supports an approach where learners are able to focus on their strength rather than be dependent on traditional styles of learning.

In the time-honoured sense, teachers teach and students learn. In the post modern sense, the technology leaders have broken away from this model, or as Hlynka (1995) says, there is a break up of the canon. The technology leaders are quite happy to change their conventional role as the sage on the stage, and they willingly acknowledge that they often learn from their students, and allow their students to teach others in the class.

When the discussion with the technology leaders in this study focused on their own skill acquisition, an interesting pattern evolved. They all had followed their own path. This path did not include formal course work in most instances. Where coursework was taken, it was triggered by a school-based project. "This model, experientially based, hones and refines the practitioner's personal and individual competence – a competence generated not through certified courses of study but through reflections on and in lived experience." (Doll, 1993, p.46) The nominated teachers shared a variety of practical workshop experiences or sometimes they described informal meetings, like sitting with a colleague working through a techno-glitch, or teaching strategy. Each leader was quick to recognize the importance of being open to collegial suggestions. One of the younger participants who was relatively new to the teaching profession spoke with modesty. I was reminded of *Jonathan Livingston Seagull* addressing his friends, his teachers, "I'm the newcomer here! I'm just beginning! It is I who must learn from you" (Bach, 1970, p.83). So it was with at least four of the interviewed teachers. They considered their colleagues in the building to be far more proficient in the field of educational technology. In fact, they identified their colleagues as mentors in the area of technology integration.

As a final discussion point, and noted as a concern at the beginning of this section, financial concerns will continue to grow as budgets are reviewed and prioritized. It has been suggested that jurisdictions should be setting aside 25-30 percent of their technology budgets towards professional development (Carvin, 1999; Latham, 1999). In Figure 3.1, on page 38, the Secretary Treasurer of the Fort Garry School Division did not

identify the actual dollar amount or percent designated to professional development, mentioning only equipment and services. To add a professional development category over the two year period identified in the 1998-200 budget would have meant an increase of approximately $45 000, or about $22 000 a year. It is with a sense of realism that I acknowledge it may be very difficult to access more funding. It may be necessary to re-evaluate how we are currently utilizing dollars and attempt to restructure budgets so that teacher training and professional development may occur in the area of educational technology.

The technology leaders willingly shared their experiences and stories. What I found missing from their discussions was specific recommendations for immediate action. The lack of specific direction provides the natural springboard for the last chapter, which will include my recommendations, based on the nuances of the discussions. The recommendations presented there are the synthesis of my own understanding of the education system in the Fort Garry School Division, and the interviews conducted with the elementary technology leaders.

# Chapter 6

## Recommendations

*We expect new developments, new products and new experiences. I have the uncomfortable feeling that we often overlook the reasons for all the innovations. We do not seem to ask, "Why?"* (Ely, 1994, p.4)

One of my original reasons for pursuing this thesis topic came from the title of Donald Ely's (1995) article, found in the bibliography of the Inkster (1998) thesis, *Technology is the Answer! But What Was the Question?* In preparing for the final section on recommendations, I wish to look back into that article and list the critical conditions that Ely (1995) noted in schools that had successfully integrated educational technology. I will use this list to facilitate my own list of recommendations. The eight conditions are:

1. Dissatisfaction with the status quo
2. Knowledge and services
3. Resources
4. Rewards and incentives
5. Commitment
6. Leadership
7. Time
8. Participation

### Specific Recommendations

The following recommendations are listed in order of Ely's eight conditions for successful integration of educational technology. This list is not intended to follow any specific order, nor should the number be construed to represent a level of importance.

**1) Status Quo:** The first condition is dissatisfaction with the status quo, and leads naturally to a call for action. These eight recommendations, linked to the eight conditions listed above are that call for action. The following recommendations are

representative of the collective vision of the elementary technology leaders as well as my own personal belief and vision of where we can go. My first recommendation is, that a Fort Garry School Division committee be created, and given the task of reviewing the issues that have emerged as a result of this study.

**2) Knowledge and Services:** There may be a natural link in the area of Professional Development for a teacher, and the concept of "integration" presented in Chapter Two. The Fort Garry School Division has already committed financial and human resources into cognitive coaching and cooperative learning. The practices of cognitive coaching and cooperative learning are structures or strategies; they are not subject or topic specific. They do lend themselves to collegial support in professional development at an individual and personal level. My second recommendation is that a technology forum be created that will allow all interested teachers the opportunity to meet and discuss the art and/or science of teaching with technology.

**3) Resources:** My third recommendation is that a hardware and software review needs to be conducted to determine the real needs of each of the individual schools. Currently, in the Division, there is an equity practice that equips all elementary schools with labs of twenty-five computers, regardless of the school population. The review could reflect on three critical questions: 1) What is the purpose of the hardware/software? 2) How will it be used, and by whom? 3) How will we evaluate the consequences of the first two questions? The findings of this study would then be used to create a new hardware/software acquisition plan.

**4) Rewards and Incentives:** Currently the Fort Garry School Division has an employee computer purchase incentive plan. My fourth recommendation is to maintain and expand the current Divisional plan. The new plan would allow greater freedom within the area of items available to staff to include all peripheral devices that the schools currently own and operate. This could include laptop computers, scanners, printers and digital cameras. The goal of this expanded service would be to allow teachers to become comfortable using tools they have available at school. Currently the plan calls for payback interest free over one calendar year. Perhaps this could be extended to allow for up to a maximum of two years where staff members may be making purchases that are linked to a specific school or Divisional project. An additional incentive could also include providing teachers involved in special initiatives greater freedom in borrowing Division equipment as part of a professional growth plan.

**5) Commitment:** Over the past two–three years, schools have been developing extensive school plans as part of a prescribed school improvement and accountability plan required by the Manitoba Education and Training. My fifth recommendation is that each school committee reviews the on-going integration of educational technology in all aspects of the school community and includes educational technology in areas where it can be used to enhance learning and instructional practices as part of their school plan.

**6) Leadership:** As noted by the participants in Chapter Four, few schools have taken the time to discuss thoroughly the provincial document *Technology as a*

*Foundation Skill.* (1998) Given the importance and ubiquitous nature of technology in our daily lives, the sixth recommendation from this thesis is that the Division implement a strategy that would enable teachers to become familiar with this provincial directive and then initiate appropriate suggestions from the document. In addition to looking after this piece of technology, the technology leaders should take up a leadership role and initiate a series of workshops on the new Manitoba Education and Training resource, The Curriculum Navigator.

**7) Time:** The Fort Garry School Division eliminated the .1 full time equivalent elementary technology teacher position in the Year 2001-2001 school budget process. The loss of this staffing to each school removed the leadership potential in the area of educational technology just as schools were receiving increases in hardware and fiber network infrastructure. It will be critical that the support provided by that technology teacher be maintained through other initiatives or else the gains made in developing staff will be at risk. In lieu of the technology leader staff piece, time there has been provision made for substitute release time for curriculum leaders. My seventh recommendation is that substitute-teacher release time be provided to permit a collegial mentor program similar to the one implemented in Grand Forks, North Dakota (Carlson, 1997).

**8) Participation:** The new joint Fort Garry School Division/Fort Garry Teachers' Association professional development fund was created out of a contract negotiation that ended the former sabbatical leave benefit. My eighth and final recommendation is that this fund be made available to individuals and groups willing to join inter-school

technology study groups. These groups could be tasked with a second study, conducted as a follow-up to this thesis. That study could follow the same qualitative process; but focus on teachers experiencing difficulty, or wishing to improve their comfort level in teaching with technology. An alternative to the study would be to establish a mentoring situation, whereby a technology leader would partner with a teacher experiencing difficulty in their school or the Division, but interested in integrating technology into their daily lesson planning. In fact, the study group may set as their own task, any specific educational technology issue.

**Conclusion**

This study has focused on teachers in the Fort Garry School Division in Winnipeg, Manitoba, Canada. The stories told by the technology leaders are special, but they are not unique. I believe that the conclusion could be summarized in a few succinct words. The technology leaders believe that more time is needed for elementary teachers to plan collegially effective integration of educational technology and at the same time to develop their own comfort and confidence with the evolving educational technologies. The trials and tribulations expressed may be representative of those from teachers around Winnipeg, Manitoba, and even Canada. It is not my intention to attempt to generalize the findings or the recommendations, as that would be inconsistent with a qualitative study.

The qualitative method and the long answer interview process allowed me to utilize my connoisseurship in establishing patterns and needs from my experience base. I believe it is possible for others to read this thesis and devise alternatives and I encourage

them to do just that. After all, it is consistent with the postmodern condition that there be multiple truths, different perspectives and no one single correct answer.

## Appendix A

## Ethics Protocol Submission Form

## Required Information about the Research Protocol

1) **Summary of Project:** The main purpose of this study is to gather information for my thesis in the area of Educational Technology. I plan to look at current best practices of the integration of educational technology in the elementary years (Kindergarten to Grade Six) in an urban public school division.

   Participants will be invited to meet one on one with the researcher to answer predominately long answer questions. The questions and responses will be tape-recorded and then the transcripts will be word processed verbatim. A copy of the transcript will be returned to the participants for verification and editing prior to their being used in the study. Participating schools will be assigned a number in random order and the participants will be identified with a letter, also at random.

   The interviews will be conducted at a time and location that is convenient to the participant, likely their school. A block of an hour or less will be required to complete the interview questions.

2) **The Research Instrument**: The instrument is comprised of a series of short and long answer interview questions. Appendix B.

3) **Study Subjects:** The proposed subjects are a nominated group of K-6 classroom teachers in the Fort Garry School Division #5. (Superintendent's permission in principle see Attachment 5) The actual survey group will be a maximum of twelve teachers and or administrators. The group will include one person from each elementary school in the Division. Their school principal will nominate the individual as being someone who is knowledgeable and an acknowledged teacher and or leader in the field of educational technology. (See Attachment 2) Nominated teachers will have the right of refusal as this is strictly a voluntary procedure. Should the teacher refuse, the administrator could answer questions for the school or the school could be excused from the sample group.

4) **Informed Consent:** See Attachment 3

5) **Deception:** Not applicable

6) **Feedback/Debriefing:** The initial feedback will be provided to individual participants through a hard copy of the verbal interview. The hardcopy will be

used to verify and clarify any of the initial responses. All participants will be offered the opportunity to meet in person or via telephone at this time. At the completion of the thesis, participants will be offered a copy of the findings. (See Attachment 4

7) **Risks and Benefits:** To the best of my knowledge, there are no physical or psychological risks involved with this interview. The anticipated benefits from the process include the sharing of the findings with interview participants as well as interested members of the Fort Garry School Division. The Division has in place a staff development program that focuses on personal and professional growth. It is believed that findings in the area of professional development could provide
teachers with ideas that could be melded with their own professional growth model plan.

8) **Anonymity and Confidentiality:** Total participant anonymity is not planned, as I will know the participants through the in person interview process. However, their anonymity will be protected by me in the report and throughout the writing process. There will be no direct references to individuals or the schools in which they work. If comparison is required, schools and participants will be given a random alpha/numeric descriptor. Gender neutral terms will be employed to further protect the respondents.

9) **Compensation:** No financial compensation is planned.

## Attachment 2

**Letters to School Principals:**

Dave Benson
3 LeClair Place
Winnipeg, Manitoba
R3V 1R7

Dear (School principal)

As a graduate student at the University of Manitoba, I am currently conducting research for my thesis requirement for the Master's degree in Education. The title of my study is *The Integration of Educational Technology in the Elementary School.*

I wish to examine how teachers integrate technology into their daily lessons. My research will involve interviewing classroom teachers and or administrators for a period of not more than an hour.

To select interview participants, I am requesting that school administrators in the elementary schools of Fort Garry School Division nominate a teacher who is acknowledged as being someone who is comfortable in the use of educational technology, or who is a member of the school's technology leadership team. Mr. Jean Beaumont has granted approval in principle for the study to take place in the Fort Garry School Division.

I have attached the set of questions to provide a sense of the direction in the proposed interview. The process will involve an in person interview, during which time I will tape record the conversation for transcription and future analysis. Prior to the analysis, I will provide the participant with a hard copy for verification and any further clarification. At that time, I would arrange a second meeting, in person or on the phone, to discuss any concerns or questions that arise from the transcript prior to final analysis.

All information shared will be anonymous. Confidentiality is assured. Names, schools and any identifying indicators will not be shared in any context at any time. Audio tapes will be destroyed when the data documentation is complete.

Volunteers for the study may withdraw at any time.

If you have any questions about this study, you may contact me at my home number 269-1967 or during the day at Whyte Ridge School 488-4245 or email dbenson@fgsd.winnipeg.mb.ca. My faculty advisor is Dr. James Welsh, and his office number is 474-9072.

If you are willing to nominate a participant, please complete the form below and return it to me in the enclosed, self addressed stamped envelope by December 1st, 2000. In lieu of the form below, you may contact me via email transmission or a telephone call. I will then send a similar notification to all nominated teachers asking their permission to meet and be interviewed at a time and location of their convenience.

Sincerely,

**Attachment 3**

**Letter of Invitation to Teachers:**

Dave Benson
3 LeClair Place
Winnipeg, Manitoba
R3V 1R7
January, 2001

Dear (Participant),

As a graduate student at the University of Manitoba, I am currently conducting research for my thesis requirement for the Master's degree in Education. The title of my study is *The Integration of Educational Technology in the Elementary School.*

I wish to examine the ways and means teachers use to integrate technology into their daily lessons. My research will involve interviewing classroom teachers and or administrators for a period of not more than an hour.

Your school principal has nominated you as a teacher who is acknowledged as being comfortable in the use of educational technology, or as a teacher who is a member of the school's technology leadership team. Mr. Jean Beaumont has granted approval in principle for the study to take place in the Fort Garry School Division.

I would like to invite you to participate in this study. I have attached the set of questions to provide a sense of the direction in the proposed interview. The process will involve an in person interview during which time I will tape record the conversation for transcription and future analysis. Prior to the analysis, I will provide you with a hard copy for verification and any further clarification. At this time, we can arrange a second meeting in person or on the phone to discuss any concerns or questions that arise prior to final analysis.

All information shared will be anonymous. Confidentiality is assured. Your name, school and any identifying indicators will not be shared in any context at any time. Audio tapes will be destroyed when the data documentation is complete.

As you have been asked to volunteer for the interview you may feel free to withdraw from the study at any time and any data will be withdrawn.

Upon completion of my research project, I would be happy to share a summary of the results with you.

If you have any questions about this study, you may contact me at my home number 269-1967 or during the day at Whyte Ridge School 488-4245 or email dbenson@fgsd.winnipeg.mb.ca. My faculty advisor is Dr. James Welsh, and his office number is 474-9072.

If you are willing to participate in my study, please sign the consent form below and return it to me in the enclosed, self addressed stamped envelope by January --th, 2001. If you decide to participate, I will call to set up a time and location that is convenient for you.

Sincerely,

Dave Benson

---

I, _____, am willing to be a participant in the study of research as described in the letter above. Information gathered from the interview process may be reported anonymously in the thesis identified by Dave Benson as *The Integration of Educational Technology in the Elementary School.*

Signature of Volunteer Participant: _____

Date: _____

**Attachment 4**

**Transcript Review:**

Dave Benson
3 LeClair Place
Winnipeg, Manitoba
R3V 1R7

Dear (Participant),

Thank you for participating in the research study related to my thesis for the Master's Degree in Education at the University of Manitoba.

I have had transcribed our interview. Enclosed is the transcript.

Please review this information and contact me at 269-1967 (H) or 488-4245 (W) if it is necessary to edit or change any of the content. This debriefing session may be by telephone or in person, and it will be arranged at your convenience. If I do not hear from you by February --th, I assume everything is accurate for me to proceed.

I appreciate your most valuable contribution of sharing thoughts, educational views and most certainly your time. Upon completion of my research project, I shall be happy to share a summary of my results with you.

Sincerely,

Dave Benson

**Attachment 5**

**Permission of Fort Garry School Division**

25 September, 2000

Mr. Jean Beaumont
Superintendent
Fort Garry School Division #5
181 Henlow Bay
Winnipeg, Manitoba
R3Y 1M7

Dear Jean,

I am writing to you to request approval in principle for the opportunity to interview up to a dozen teachers and or administrators in the Fort Garry School Division. I am currently in the process of developing a Master's thesis at the University of Manitoba. My plans include a qualitative study on "The Integration of Educational Technology in the Elementary Years".

Prior to actually conducting interviews I would provide my questions to you and the group of nominated teachers seeking their interest and permission to proceed. I would request that their schools nominate the teachers as being leaders in the field of educational technology. These interviews if granted would be conducted at the convenience of the interviewee, and completed by January. All conversations will be tape recorded and hard copy returned for verification to the participants before being used in my thesis.

It is my hope that I will be able to "recognize, describe educational technology and cause more of it to happen." I will gladly make myself available on completion of the thesis to share my findings with participants or other interested parties of the Fort Garry School Division.

Sincerely,

Dave Benson

## Appendix B:

**Part I:**

General Demographics:

Gender _____ Grade _____ Years Teaching _____

Do you have a computer in your classroom? Details on type, peripherals and connectivity

Do you have a computer _____ laptop _____ at home? Details.....

Do you use your home computer for school related activities?

**Part II:**

1. Could you please describe for me what the term "educational technology" means to you?

*(if not part of the answer, informal discussion on Technology as a Foundation Skill and the school's implementation/familiarity with the document.)*

2. When were you first aware that you were integrating educational technology as part of your teaching repertoire?

*(identify calendar year or year relative to teaching experience, what equipment, hardware/software was used, what were the triggers – how... why... , supports, source of feedback, training and or professional development undertaken)*

3. Could you please describe for me a significant activity for you and or your class that involved the integration of educational technology?

   *(How have you been able to use it to enhance your teaching and student learning? As per #2 what equipment, hardware/software was used, what were the triggers – how... why... , supports, source of feedback, training and or professional development undertaken)*

4. The editor of a distinguished educational journal has just invited you to submit an essay on your use of educational technology in the classroom. What is the title of your article and what are the key points for discussion?

   *(take a few minutes to describe the sub headings, what will be the key points in the paper)*

5. How can we as individuals, school staffs or a division cause more integration of educational technology to occur in our classroom/schools?

| | |
|---|---|
| **1** | *Need more time to learn to use computers and the Internet.* |
| **2** | *Need more time to adapt the curriculum to better incorporate the technology.* |
| **3** | *Need more training with user skills related to technology.* |
| **4** | *Need more training with curriculum and pedagogy that integrates technology.* |
| **5** | *Need access to more powerful computers for my students.* |
| **6** | *Need access to more computers for my students.* |
| **7** | *Need better access to the Internet.* |
| **8** | *Need more software that is curricular-based.* |
| **9** | *Need more technical support to keep the computers working.* |
| **10** | *Need more resources that illustrate how to integrate technology into the curriculum.* |
| **11** | *Need a program support teacher or mentor to assist in cognitive coaching activities to develop integration strategies.* |
| **12** | *Need more opportunities to work with colleagues to develop and use technology-enhanced curriculum units.* |
| **13** | *Need more compelling reasons why I should incorporate technology into the classroom.* |
| **14** | *If the Division offered professional development sessions on the integration of educational technology in after school sessions I would attend them.* |
| **15** | *If the Division offered professional development sessions on the integration of educational technology on scheduled release time I would attend them.* |
| **16** | *If my Division offered free Internet based, on-line professional development activities, I would use them.* |
| **17** | *If my Division offered Internet based, on-line professional development activities at a user pay fee, I would use them.* |

6. **Are there any issues or concerns regarding the integration of educational technology in the elementary classroom that you wish to add?**

## Appendix C

# Survey Number 1

| Teacher Attitudes Toward Computer Technology: | | SD | D | U | A | SA |
|---|---|---|---|---|---|---|
| 1 | I believe that it is very important for teachers to learn how to use a computer. | | | | | |
| 2 | I feel comfortable with my current skills level in working with a computer. | | | | | |
| 3 | When there is a problem with a computer that I can't immediately solve, I commit to resolving the problem at the appropriate time or finding a resource that can help me. | | | | | |
| 4 | Knowing how to use a computer is a worthwhile skill. | | | | | |
| 5 | All students should have an opportunity to learn about computers at school. | | | | | |
| 6 | Having computer skills provides a wider range of job opportunities. | | | | | |
| 7 | Computers have the potential to control our lives. | | | | | |
| 8 | Computers isolate people by inhibiting normal social interactions among users. | | | | | |
| 9 | Computers have the potential to improve education. | | | | | |
| 10 | Having a computer in my classroom helps me to be a more effective teacher. | | | | | |
| 11 | Computers can be useful instructional aids in all core subject areas. | | | | | |
| 12 | Use of computers in education, reduces the personal treatment of students. | | | | | |
| 13 | Computer use stimulates my creativity. | | | | | |
| 14 | Computer use increases my productivity. | | | | | |
| 15 | Computers use is part of life long learning. | | | | | |
| 16 | Computers improve the overall quality of life by saving me time. | | | | | |
| 17 | The challenge of learning with computers is exciting. | | | | | |
| 18 | Learning to operate a computer is like learning any new skill - the more you practice, the more confident you become. | | | | | |
| 19 | Computers are necessary, in both educational and work settings. | | | | | |
| 20 | I believe that academic achievement improves with educational technology. | | | | | |
| **SD = Strongly Disagree D = Disagree U = Undecided A = Agree SA = Strongly Agree** | | | | | | |

## Survey 2

**Teacher/Student Use of Computer Technology:**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Do most of your student use ***drill and practice programs*** (i.e. educational software that engages students in multiple choice, true and false, or "worksheet" type of questions) on a regular basis as part of the curriculum? | 1 | 2 | 3 | 4 | 5 |
| 2. | Do most of your students use ***basic authoring applications*** on a regular basis as part of the curriculum? | | | | | |
| | A) word processors | | | | | |
| | B) spreadsheets | | | | | |
| | C) drawing programs | | | | | |
| 3. | Do most of your students use ***advanced authoring applications*** on a regular basis as part of the curriculum? | | | | | |
| | A) web publishing software | | | | | |
| | B) presentation software | | | | | |
| 4. | . Do most of your students use ***simulation software*** on a regular basis as part of the curriculum? | | | | | |
| 5. | Do most of your students use ***CD-ROM research resources*** (i.e. CD ROM encyclopedias) on a regular basis as part of the curriculum? | | | | | |
| 6. | Do most of your students use the ***World Wide Web*** on a regular basis as part of the curriculum? | | | | | |
| 7. | Do most of your students make use of ***networked communications*** (i.e. e-mail, list serves, ask an expert, etc. to contact resources outside the classroom) on a regular basis as part of the curriculum? | | | | | |
| **Please use the 1 – 5 graded scale to indicate amount of use. 1 = Seldom, 5 = Frequent** | | | | | | |

This questionnaire is designed to assess your perceptions of the use of information technology for your own productivity as well as for the benefit of your students. Usually it is best to respond with your first impression, without giving a question much thought.

**Instructions:** Choose one location between each adjective pair to indicate how you feel about the object. Low numbers indicate low value as the opposing terms suggest.

**To me, electronic mail is:**

| | Value: 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| Important | | | | | Unimportant |
| Appealing | | | | | Unappealing |
| Facilitative | | | | | Hindrance |
| Creative | | | | | Stifling |

**To me, using the World Wide Web is:**

| | Value: 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| Important | | | | | Unimportant |
| Appealing | | | | | Unappealing |
| Facilitative | | | | | Hindrance |
| Creative | | | | | Stifling |

**To me, multimedia** (ie. HyperStudio, Powerpoint, KidPix, etc) **is:**

| | Value: 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| Important | | | | | Unimportant |
| Appealing | | | | | Unappealing |
| Facilitative | | | | | Hindrance |
| Creative | | | | | Stifling |

**To me, using computers for my professional use is:**

| | Value: 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| Important | | | | | Unimportant |
| Appealing | | | | | Unappealing |
| Facilitative | | | | | Hindrance |
| Creative | | | | | Stifling |

**For my students, using computers in the classroom is:**

| | Value: 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| Important | | | | | Unimportant |
| Appealing | | | | | Unappealing |
| Facilitative | | | | | Hindrance |
| Creative | | | | | Stifling |

**Teachers: Please answer for students in your class.**

_____ computers per classroom. _____ Internet connections per classroom.

_____ Printer/Network Printer available

1) Students engage in computer-based activities (but not Internet) for curricular purposes during the school day: (minutes/week)

___ 0 minutes ___ less than 15 minutes ___ 15-45 minutes

___ 46-90 minutes ___ more than 90 minutes

2) Students engage in Internet-based activities for curricular purposes during the school day: (minutes/week)

___ 0 minutes ___ less than 15 minutes ___ 15-45 minutes

___ 46-90 minutes ___ more than 90 minutes

3) Please indicate the percent of student computer use that is done in the school lab:

____ less than 25% ____ more than 25% ____ more than 50% ____ more than 75%

**Teachers: Please answer the following in relation to your teaching activities.**

3) Do you have a computer at home? Yes ___ No ___

4) Is it compatible with school's system? Yes ____ No ____

5) Do you have a laptop? Yes ___ No ___

6) Is it compatible with school's system? Yes ____ No ____

7) I use the computer (but not Internet) in my teaching activities: (minutes/week)

___ 0 minutes ___ less than 15 minutes ___ 15-45 minutes

___ 46-90 minutes ___ more than 90 minutes

8) I use the computer (but not Internet) in my classroom administrative functions: (minutes/week)

___ 0 minutes ___ less than 15 minutes ___ 15-45 minutes

___ 46-90 minutes ___ more than 90 minutes

9) I use the Internet in my teaching activities: (minutes/week)

___ 0 minutes ___ less than 15 minutes ___ 15-45 minutes

___ 46-90 minutes ___ more than 90 minutes

10) I use the Internet in my classroom administrative functions: (minutes/week)

___ 0 minutes ___ less than 15 minutes ___ 15-45 minutes

___ 46-90 minutes ___ more than 90 minutes

11) I use the computer (but not Internet) in my personal functions: (minutes/week)

___ 0 minutes ___ less than 15 minutes ___ 15-45 minutes

___ 46-90 minutes ___ more than 90 minutes

12) I use the Internet for personal functions: (minutes/week)

___ 0 minutes ___ less than 15 minutes ___ 15-45 minutes

___ 46-90 minutes ___ more than 90 minutes

## Survey 3
## Teacher Professional Development and Computer Technology:

1) What percentage of the information you receive about teaching with technology is from: (Please estimate the amount for <u>each</u> category)

_____ % Conferences/Displays _____ % Research Journals

_____% Local Workshops _____ % Professional Magazines

_____ % Peer tutoring _____ % Internet (www, listservs, etc.)

_____ % Self taught _____ % other P.D. please specify _____

2) Do you have a computer at home that you use for school related:

___ email ___ Internet ___ other school activities

3) Do you have a computer at home you use for personal related:

___ email ___ Internet ___ other activities

**Please complete the survey questions in the tables below.**

| **What, if anything, do you need to make technology an integral part of your classroom's curricular activities? Please select the appropriate box.** | | | | | | |
|---|---|---|---|---|---|---|
| | | **SD** | **D** | **U** | **A** | **SA** |
| 1 | Need more time to learn to use computers and the Internet. | | | | | |
| 2 | Need more time to adapt the curriculum to better incorporate the technology. | | | | | |
| 3 | Need more training with user skills related to technology. | | | | | |
| 4 | Need more training with curriculum and pedagogy that integrates technology. | | | | | |
| 5 | Need access to more powerful computers for my students. | | | | | |
| 6 | Need access to more computers for my students. | | | | | |
| 7 | Need better access to the Internet. | | | | | |
| 8 | Need more software that is curricular-based. | | | | | |
| 9 | Need more technical support to keep the computers working. | | | | | |
| 10 | Need more resources that illustrate how to integrate technology into the curriculum. | | | | | |
| 11 | Need a program support teacher or mentor to assist in cognitive coaching activities to develop integration strategies. | | | | | |
| 12 | Need more opportunities to work with colleagues to develop and use technology-enhanced curriculum units. | | | | | |
| 13 | Need more compelling reasons why I should incorporate technology into the classroom. | | | | | |
| **Please select the box that best reflects your belief where SD = Strongly Disagree and SA = Strongly Agree.** | | | | | | |
| | | **SD** | **D** | **U** | **A** | **SA** |
| 1 | I believe that textbooks will secondary to electronic media within 5 years. This means my teaching style will need to change to accommodate the shift. | | | | | |
| 2 | I believe that the role of schools will be dramatically changed because of the Internet. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | This means my teaching style will need to change to accommodate the shift. | | | | | |
| 3 | If the Division offered professional development sessions on the integration of educational technology in after school sessions I would attend them. | | | | | |
| 4 | If the Division offered professional development sessions on the integration of educational technology on scheduled release time I would attend them. | | | | | |
| 5 | If my Division offered free Internet based, on-line professional development activities, I would use them. | | | | | |
| 6 | If my Division offered Internet based, on-line professional development activities at a user pay fee, I would use them. | | | | | |

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