

**I.C.T.: AN IMPLEMENTATION STRATEGY IN THE FOOTHILLS SCHOOL  
DIVISION FOR THE NEW ELEMENTARY CURRICULUM**

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## Dedication

This project is dedicated to my wife Cheryl and my daughters Jade and Keara, whose love and support make everything possible. I also dedicate this to my mom, dad and sister. I'm as proud of you, as you are of me.

## Abstract

ICT is the new Information and Communication Technology Curriculum, which has been mandated for use in schools as of September 1, 2000. Schools in Alberta have three years to fully integrate this program into their daily educational practices, not as a separate course but rather as a curriculum woven throughout the curricula. This project looks at the methods used to implement ICT in one school in the Foothills School Division.

## Acknowledgments

I would like to extend my thanks to all of those people who have leant their expertise and assistance in helping me to create the largest volume of writing, which I have done thus far in my life. The work was incredible and now that the journey has been completed, I look back with pride at the work that I have done, unbelieving at the distance I have travelled and the work that I have done.

Thanks to the professors and the Faculty of Education at the University of Lethbridge for renewing my interest in educational research. My route to becoming a teacher was not a direct one and many of the discussions filled in the missing bits of information which further deepened my understanding of the educational model.

The Foothills School Division has been very good to me. It has educated me, given me employment, educated my children and now it has allowed me to conduct my research for this project. A special thanks to the members of Division Office, Executive Council, the Board and staff of the Foothills School Division.

I would like to thank the Foothills Cohort who have become like family during the two and a half years of this project. It has been fun yet challenging and in the words of one of our members, "It takes a whole cohort to raise a baby", or in this case to complete a project.

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## Table of Contents

|   |     |
|---|-----|
| Dedication .....                                | iii |
| Abstract .....                                  | iv  |
| Acknowledgements.....                           | v   |
| Table of Contents.....                          | vi  |
| List of Tables .....                            | x   |
| Chapter 1: Background to the Project.....       | 1   |
| What is AISI? What is ICT?.....                 | 1   |
| Purpose and Focus of the Project .....          | 2   |
| Chapter 2: Review of Literature.....            | 4   |
| A Brief History of the Computer.....            | 4   |
| History of the World-Wide Web.....              | 8   |
| Credibility of the World-Wide Web.....          | 13  |
| Educational Technology .....                    | 16  |
| ICT and Global Education.....                   | 22  |
| Educational Policies for Technological Use..... | 24  |
| Technology Use World Wide.....                  | 26  |
| Opponents of Computer Use.....                  | 28  |
| Summary.....                                    | 33  |
| Chapter 3: Method Proposed for the Project..... | 38  |
| Background to the Methodology.....              | 38  |
| Methodology.....                                | 38  |
| Conclusion of Methodology.....                  | 45  |

|   |    |
|---|----|
| Chapter 4: Analysis of Results.....                                       | 47 |
| Program Premise.....  | 47 |
| Findings of Survey.....   | 50 |
| Findings of Interviews – Strengths.....                                   | 54 |
| Findings of Interviews - Weaknesses.....                                  | 57 |
| Chapter 5: Summary / Conclusions.....                                     | 61 |
| Summary.....  | 61 |
| Conclusion.....   | 62 |
| Implications of the Work.....   | 65 |
| References.....   | 67 |
| Appendices:   |    |
| A.    Survey Questions.....   | 73 |
| B.    Interview Questions.....  | 75 |
| C.    Division I / Division II Teaching Assignment.....                   | 77 |
| D.    Involvement with Curricula Implementation Teams.....                | 78 |
| E.    Involvement with Curricula Implementation Teams by Division.....    | 79 |
| F.    Personal Technology Skills Rating – September 2000.....             | 80 |
| G.    Personal Technology Skills Rating by Division – September 2000..... | 81 |
| H.    Personal Technology Skills Rating – September 2001.....             | 82 |
| I.    Personal Technology Skills Rating by Division.....                  | 83 |
| J.    Personal Technology Skills Comparison – 2000 vs. 2001.....          | 84 |
| K.    Personal Technology Skills Comparison by Division / Year.....       | 85 |
| L.    Teacher’s Opinion of Student’s Technical Expertise.....             | 87 |

|    |   |     |
|----|---|-----|
| M. | Teacher’s Opinion of Student’s Technical Expertise by Division.....   | 88  |
| N. | Teacher’s Understanding of Information and Communication<br>Technology.....   | 89  |
| O. | Teacher’s Understanding of Information and Communication Technology<br>by Division.....                                   | 90  |
| P. | Divisional Support for Implementation of Information and<br>Communication Technology Curriculum.....                      | 91  |
| Q. | Divisional Support for Implementation of Information and<br>Communication Technology Curriculum by Division.....          | 92  |
| R. | School Support for Implementing the Information and Communication<br>Technology Curriculum.....                           | 93  |
| S. | School Support for Implementing the Information and Communication<br>Technology Curriculum by Division.....               | 94  |
| T. | Divisional Technical Support for Implementing the Information and<br>Communication Technology Curriculum.....             | 95  |
| U. | Divisional Technical Support for Implementing the Information and<br>Communication Technology Curriculum by Division..... | 96  |
| V. | Information and Communication Technology Curriculum Implementation<br>Method vs. Other Curricula.....                     | 97  |
| W. | Information and Communication Technology Curriculum Implementation<br>Method vs. Other Curricula by Division.....         | 98  |
| X. | Foothills School Division AISI ICT Project: Year One Steering<br>Committee Report.....                                    | 100 |

Y. Transcript Dissemination.....109

## List of Tables

### Tables:

|                               |    |
|-------------------------------|----|
| 1. Legend for Appendix K..... | 86 |
| 2. Legend for Appendix L..... | 99 |

## Chapter 1: Background to the Project

This year I was fortunate enough to be involved in an AISI project for the Foothills School Division. Although AISI funding was available and distributed throughout the division for a number of projects, I was involved with the team that oversaw the implementation of the new Information and Communication Technology curriculum in the school division. Not only was the initial proposal from our school included in the project but I was also on the divisional team, which designed the framework for the implementation of this project throughout the school division.

The manner by which schools were selected to become part of the program was very basic. All of the schools that were part of the initial proposal for the individual AISI grants were asked to submit a second proposal on behalf of their staff. This proposal stated the willingness of the entire staff to become part of this program. This, in turn, was followed by another detailed account of whether each school wished to be part of this three-year process in either the first, second or third year. It was determined that each year would be considered an Orbit and each school which was part of that year would be referred to as an Orbit 1, Orbit 2 or Orbit 3 school. It was the goal of Blackie Elementary School to be part of the first year's implementation team or as it is referred to more commonly, an [Orbit 1 School], and we were able to achieve our goal.

### What is AISI? What is ICT?

In order to fully understand the scope of this project it is necessary to understand the background behind the terms AISI and ICT.

Tony Hampshire is a member of the district team responsible for working with the schools on this project. In a personal interview (November 12, 2000) he describes AISI as

“The Alberta Initiative for School Improvement” which “provides project funding to schools and districts to promote student learning through innovative approaches to staff development and curriculum implementation or enrichment” (Hampshire, 2000).

Through this program staffing has increased, with one .3 FTE teacher being added to each staffing equation. There is great discussion as to what will happen when this funding finishes after its three-year mandate. Tony Hampshire (personal communication, November 19, 2001) notified me that the AISI project appears to be a pet project of the current Learning minister and, because there has been strong success in year one, funding has been approved for a fourth year with rumours of funding continuing beyond that.

There is greater certainty about the implementation of the government’s new curriculum, commonly referred to as ICT. The ICT (Information and Communication Technology) curriculum

provides a broad perspective on the nature of digital technology, how to use and apply a variety of technologies, and the impact of ICT on self and society. Students in Kindergarten through Grade 12 will be encouraged to grapple with the complexities, as well as the advantages and disadvantages, of technologies in our lives and workplaces. (Alberta Learning, 2001, p. 1)

#### Purpose and Focus of the Project

The purpose of this research is two-fold. The first intent of the research is to investigate the method by which the Foothills School Division is implementing the new ICT (Information and Communication Technology) curriculum. The second intent is to find out if teachers are more receptive to this implementation model.

Although the sample is small I am proposing that the research will reflect the impression of many teachers in a small rural setting.

The measure of the success of the implementation model will be collected through the use of a survey and personal interview. From an analysis of this data it is intended that the hypothesis will be verified or not verified.

The survey and personal interviews are intended to gather teacher perceptions of the implementation strategies used to implement the new ICT curriculum in one school in the Foothills School Division. As more schools are involved in the school division's implementation program, a larger sample could be obtained.

## Chapter Two: Review of the Literature

### A Brief History of the Computer

Computer based education has grown out of the development of the computer which first came into being about fifty years ago. In 1945, women were used to calculate the trajectory for artillery gunners, as men lacked the patience for such a tedious job. The army referred to these women as computers and they were the best and the brightest in mathematics from around the United States. In 1945, ENIAC was assembled as one of the first machines capable of doing the work of the *computers*. ENIAC was one hundred feet long, ten feet high and had over 17,480 vacuum tubes. In order to run this machine, people needed to set dials, change cables and program every item that was input into it. These people came to be known as *programmers*. Jean Bartik, Betty Holberton, Marlyn Meltzer, Ruth Teitelbaum, Kay Antonelli, and Frances Spence were assigned to the ENIAC project. There were no user's guides, operating systems or computer languages, just hardware and human logic. "The ENIAC," says Bartick, "was a son of a bitch to program." With the aid of the *programmers* the first test went off without a hitch. As a sign of the times, the men went out to celebrate and the women went home.

The greater injustice is not history's treatment of the women but its resistance to revision . . . [For example,] until [an enthusiastic historian] made an issue of it, most of the programmers had not even been invited to the gala dinner . . . celebrating the 50<sup>th</sup> anniversary of ENIAC. (Bathroom Reader's Institute, 1997)

It seems like a long time ago but in reality only fifty-six years have passed since the world's first computer issued data based upon the information, which was input into

it. To the scientists of 1945, a curriculum based upon computer technology would have been as realistic as the gadgets used by Buck Rogers. Gene Roddenberry created many far-fetched images on his 1960s television show Star Trek; many of those dreams, however, have come to fruition. Today we need and demand the latest technologies in order to survive in our market economy and yet we marvel at what science is going to do for us next. Just as injustice was done to those women who paved the way for all computer use today, so too might we blunder and make mistakes with the implementation of the current Information and Communication Technology curriculum. Perhaps one day, someone will be reading about the 21<sup>st</sup> century and snicker at the seemingly moronic way that they did things back then.

Early computers such as Harvard's Mark 1, created in 1944 and The University of Pennsylvania's ENIAC in 1946 (Molnar, 1997) helped to solve complex mathematical and scientific calculation. The advent of these computers allowed students to work on more realistic problems which they might encounter on a day-to-day basis. In 1959, PLATO was created by the University of Illinois as a terminal server for undergraduates, colleges and local elementary schools. Molnar (1997) also states that this service allowed many users to access complex databases, far in advance of what was available to most other people in the early 1960s. In looking at the capabilities of our computers, it is unfathomable that this technology only came into being about thirty-five years ago.

Early computers required users to program functions in order to operate the system, as opposed to our plug-and-play template which computers operate on today. This required users to create punch cards which the computers read in order to perform basic actions. This type of programming is similar to the small music machines which

can be found in jewellery boxes. Small metal spools with bumps plunk stationary metal strands, as the spool spins around, to create music. On its own, the spool of bumps is unimpressive, but when it is spun in a coordinated manner it can produce the rich sounds of a beautiful melody. It is not hard to envision students with their punch cards, labouring to create a mathematical solution for their teacher, while at the same time they secretly try to create something more, some sort of game which would be considered “off-task” in terms of its function and application for the classroom. Hoyle (1995) describes Kemeny and Kurtz’s creation of BASIC (Beginners All-purpose Symbolic Instruction Code) as “an interactive computer language which allowed computer scientists to program computers more easily and efficiently”. Almost simultaneously, a team of IBM programmers was creating FORTRAN. FORTRAN was specifically created to express scientific and mathematical formulas and was not really an easy *language* for programmers to use. The technological race was now on, and it would not be too long before improved languages evolved.

As programmed instructions were being simplified, it was time to turn to the machines that did the work, the computers themselves. ENIAC is considered to be the first successful high-speed electronic digital computer (Hoyle, 1995). However, its design is not without controversy. Hoyle went on to state that after years of legal wrangling, U.S. Physicist John V. Atanasoff was awarded the patent for the use of vacuum tubes to run computer-type machines. Although this 1971 decision gave credit to Atanasoff as the inventor of the vacuum tube, it did not do much to change the annals of history as new advances in technology mothballed the unreliable vacuum tube process shortly thereafter.

Jack Kilby of Texas Instruments was the first person to successfully launch the next phase of computer technology when he finished building the first integrated circuit in September, 1958 (Polsson, 2001). Polsson goes on to link innovations in the industry such as Charles Tandy's purchase of Radio Shack, which became the main producer of home computers in the 1970s and Jack Tramiel's founding of a typewriter repair service known as Commodore Business Machines, which became one of the top three home computer makers in the 1980s. These innovators were key to the kind of entrepreneurial leadership that fuelled the growth of the computer age.

In the late 1960s, the National Science Foundation (NSF) created a support program to make computers more accessible to students in both secondary and post secondary institutions. By the mid 1970s over two million students in the U.S. had access to computers in their classrooms. Between 1963 and 1975, there had been a 54% increase in the use of computers in secondary schools. Molnar (1997) stated that

Initially, because computers were expensive, educators purchased time-shared systems and adopted procedures to ration or restrict usage to provide access to as many people as possible, given limited resources. In 1975 a remarkable thing happened. The economics that once favoured large, time-shared systems shifted to low-cost micro-computers and the personal computer revolution began.

What began as a grassroots revolution driven by students, teachers and parents, was now a new educational imperative as important as having books and libraries. (p. 3)

Today, low-cost computers run on platforms that are individually more powerful than any one nation's computer system of fifty years ago. So where does this leave us? Presently the technology exists for supercomputers to link all of society into one large database. This means that everyone connected by computers could have the same ability to access the same information.

### History of the World-Wide Web

Society now had the tools for technology and it came in the form of the computer. With its expanded computational abilities and memory (RAM) computers now contained information which far exceeded most single bound written works of the time. It now became the task of educators to devise some sort of formalized educational practice which would take advantage of computers and their capabilities. For many, the computer was just a fancy typewriter but for others, who had a broader vision, the computer was a means to go beyond the traditional role of the word processing system created by the typewriter. Computer-Assisted Instruction (CAI) and Computer-Managed Instruction (CMI) are two types of computer instruction which emerged in the mid nineteen seventies. (Heinich, Molenda, Russell, & Smaldino, 1999). Molnar (1997) stated that at the same time, "John Seely Brown developed SOPHIE, a SOPHisticated Instructional Environment, as a new kind of learning environment" whereby the computer program helps students to "articulate [their] own ideas and reasoning strategies" subject to the program's knowledge base. (p. 4) For the most part, however, computers were, at this time, something that was not part of every day life, as was the television. Johnson (1987) cites the Corporation for Public Broadcasting (1984) as classifying media and technology into three categories:

- technologies where the user has no control over the information
- technologies where the user can transmit oral or video information and
- technologies where the user has complete control over the storage and retrieval of information. (Johnson, 1987)

Today technology has moved us beyond the T.V. and many people are able to watch many of their programs via the computer and the Internet. Better yet, depending on your view of technology, computers can now be interactive with your T.V. and or the telephone, via video links. It has been difficult for educators to stay ahead of their students, who constantly strive to quench their thirst for knowledge and exploration.

How can educators compete with such an instant and successful medium of entertainment and education as in television? Rossman, Corbett, and Firestone (1988) state that school cultures are not closed systems rather that they reflect the cultures of the larger societies of which they are a part. How is it then, that educators can compete with cultural norms that are not present in the resources with which they have to teach? Textbook production lags behind technological advances, so most educators look to journal articles, conferences and local and provincial educational bodies to create resources and new curricula related to current technological trends. With most new curricula there is a plethora of supporting information to be found in magazines and professional journals. Although computers help to speed up the production of printed materials there is still a longer timeline for printing and distributing printed text.

The most relevant and most often quoted source these days seems to be the World Wide Web, on which information can be updated on a daily basis. This instant source of information is unprecedented in my opinion, seemingly unmatched by any other advance

in the history of mankind. It is staggering to imagine that “there was no World Wide Web prior to 1995” (Clifford & Friesen, 2001).

The infancy of our modern World-Wide Web began in March of 1989 but had been contemplated as far back as the early 1940s. According to Zeltser (1995), the first formalized plan for such an electronic system was published by Vannevar Bush in 1945. In his article, he saw that the information age was imminent and that there should be some way for a machine to store a vast amount of information which could be retrieved at a later date. This stored information later became known as *hypertext*, a term that was coined in 1963 and later published in 1965 by Ted Nelson, founder and pursuer of Project Xanadu (Nelson, 1998). In the 1993 web article Ted Nelson and Xanadu ([www.w3.org](http://www.w3.org), 2001, p.1) hypertext is generally defined as non-sequential writing which is best suited for computer use. Further to that, it does not only include text but also graphics, video and sound. A website designed by the organization Xanadu Australia (1997) describes Nelson’s Xanadu project as

an overall paradigm – an ideal and general model for all computers use, based on sideways connections among documents and files.

On a large scale, the paradigm means a model of publishing where anyone may quote from and publish links to an already published document, and any reader may follow these links to and from the document.

It is intended to be especially free and fair, where all authors and readers are considered equal. It is a complete business system for electronic publishing based on this ideal (sic) with a win-win set

of arrangements, contracts and software for the sale of copyrighted material in large and small amounts.

It is optimized for a point-and-click universe, where users jump from document-to-document, following links and buying small pieces as they go. (p. 3)

It must be understood that the principle of such an electronic platform is one thing but the ability to run such a platform is quite another. Enter, the U.S. military. ARPANET was developed by the Advanced Research Projects Agency (ARPA) in 1969. The premise was that researchers should be able to talk between themselves and the universities where they work, even and especially during times of crisis. “ARPANet’s design was that, because messages could be routed or rerouted in more than one direction the network could continue to function even if parts of it were destroyed in the event of a military attack or other disaster” ([www.whatis.techtarget.com](http://www.whatis.techtarget.com), 2001). According to an online article ([whatis.com](http://whatis.com), 2001), the ARPANET was replaced

in the 1980s by a separate new military network, the Defense Data Network, and NSFNet, a network of scientific and academic computers funded by the National Science Foundation. In 1995, NSFNet in turn began a phased withdrawal to turn what has become the backbone of the Internet (called vBNS) over to a consortium of commercial backbone providers (PSINet, UUNET, ANS/AOL, Sprint, MCI and AGIS-Net99) (ARPANET, 2001).

Although the National Science Foundation is still involved in funding research and sets guidelines for the network providers (Ruthfield, 1995), most new infrastructure

is being built and maintained by private corporations such as Canada's Telus, Shaw Cable and Sprint as well as a multitude of other international corporations that deal with telecommunications. It takes large corporations such as these to handle the sheer volume of the Internet. In 1995, Internet responses began at 128 requests per minute and increased at a rate of one per cent per day (Zeltser, 1995). Of course, service providers were limited and that number, although staggering at the time, is dwarfed by the magnitude of Internet use that goes on today, twenty-four hours a day.

Predictably, government agencies are looking for the next level of Internet service. Heralded as the new frontier in Internet service, the Internet 2 was created. The premise of the system is that it operates via two fiber-optic backbone networks. (Rendon, 2001) This system is about 45,000 times faster than conventional modems but it is currently an American system available only to government and educational institutions that are getting bogged down using the original Internet set-up. The Alberta Science and Research Authority (ARSA) is currently looking at running a similar system in Alberta. At present most rural Internet users use the telephone lines which operate at a top speed of 1.5 megabits per second. This means downloading is limited from as little as one-third up to a maximum of seven pages of information per second. The new Alberta Supernet will allow users to download up to 50 pages per second at 100 megabits per second. Regional health authorities will transmit and receive at about 500 pages per second. One of the considerations for both programs is cost. As an example, Internet 2 has annual fees run upwards of \$25,000 and networkability is nearer to \$1 million (Rendon, 2001). Supernet has high costs as well but the Alberta Government is helping to bring these

costs within reasonable limits. “Supernet will cement the province’s position in the knowledge economy” (Government of Alberta, 2001) and should be completed by 2003. Whatever the future brings, the Internet is full of promise and uncertainty.

### Credibility of the World-Wide Web

Today’s personal computers can be more powerful than the electronics used to send the first men to the moon, at least according to the information that tourists, including myself, are told on tours of the Kennedy Space Centre in Florida. Internet connections appear to rival time-travel. So what does this mean for students and educators in our computer labs in the 21<sup>st</sup> Century?

It should be noted that the World-Wide Web is a great avenue for sharing information from around the globe. Xanadu (Nelson, 1993) has exceeded its proposed capabilities and grown exponentially in many directions. The world has become a smaller place, yet can we trust that world that we bring to our screens? Who is posting the information? Is the literature current? Is the literature truthful? Is the Internet safe?

One way that users can check to make sure that the information is current is to check the date on which the page was last updated to make sure that the information that they are using is the most current. To do this, users need only to right-mouse click and select *view info*. This will pop up a screen which tells about the design of the page, including when it was last modified. Pages that are constructed on a daily basis will sometimes not indicate when they were last modified.

Users should also be wary about information which is placed on the web. Sometimes submissions to the web are ill-reviewed and do not face the scrutiny to which most of the other text which we find in our institutions has been subjected. An example

of this is the ongoing battle between proponents and opponents of Aspartame. A woman by the name of Nancy Markle, has spoken at environmental conferences and has posted numerous articles to the World Wide Web which talk about Aspartame and its negative affects on people. Her articles were brought to my attention during an in-service at Joe Clark School, where it was stated that Web researchers dispute her findings. My curiosity towards legitimate sources of information posted on the Internet was peaked by the articles on Markle and so I made an attempt to find out more about Internet hoaxes.

On further investigation, I found two authors who write about various subjects including Internet folklore and hoaxes. Alan Hammond and David Emery have found that Nancy Markle's real name is actually Betty Martini. Now this is not spectacular in its own right as many authors use pseudonyms for publishing purposes. However, Hammond's concerns are that many of her professional claims are unsubstantiated. Hammond (2001) has published a disclaimer which states that

I have had two messages that the following article is a hoax (and another claim that the article was written by Betty Martini). Until I've confirmed its authenticity, please keep in mind that this information is offered here because I find it interesting. Any serious choices made in life must be done with all the available information. . . . Until I can forge my own opinion . . . I will leave it up to you to investigate for yourselves. (Hammond, 1999)

The other problem with the Web is that unless a web site is carefully maintained, the information can also be quickly outdated. As with the above site, it has been updated and new articles are appended for further corroboration, but it is almost two years since

new information was added. It appears that Hammond is adept at setting up his home page on the Internet, as he has various items that you can read, play, and do while visiting his web page. The key to this is that it is a personal website and, as he states, he is offering the information for people to make their own decisions about various articles.

David Emery has worked for stage shows and television as a writer and has written about Internet folklore since 1997. His work has been critiqued by outside sources such as Iron Skillet Magazine and the Houston Chronicle, which may lend more credibility to his work, as opposed to Hammond's. Emery (1999) also feels that Martini is not a credible source. He points out that "even if we credit Martini with good intentions (and there's no reason not to), it's difficult to take her email warning seriously. Among other things, it blithely implicates aspartame as the cause of just about every malady know to humankind" (p. 2).

With the exception of such things as Hammond's personal views and Emery's more credible work regarding folklore, particularly on the Internet, there is to my knowledge no watchdog group that checks for and eliminates articles which are misleading, false or harmful. Some groups such as Netscalped.com are organizations dedicated to Internet issues that affect users of the Internet but, again they have no legal abilities to remove false, misleading or offensive documents.

Fraud and hoaxes are rampant on the Internet but most of the time it's tough to tell what's a scam and what's not. Not every Internet scam takes your money – they're just irritating and time-wasters! Intentionally misleading web sites and sifting through junk mail can be just as bad as getting "scalped" by scams, hoaxes, and fraud. (netscalped.com, 2001)

Regardless, it would be difficult to get rid of these articles as the Constitution, which North Americans avidly defend, protects them. As members of society, it is also our responsibility to decide what we will read or view and what we choose not to. This philosophy is the same one that we use for selecting appropriate television programming for our families and ourselves. I took a week and searched the web for evidence of monitoring groups and I wrote to the major news groups in both Canada and the United States. ABC, NBC, and CBC responded without knowledge of such groups and in particular, Ken Wolff (personal communication, October 29, 2001) of the CBC wrote, "Don't know of any and it would be very difficult to achieve." Therein lies one of the paradoxes of the Internet. On the one hand it is a gateway to the future based on the dreams of the past. On the other hand, our society views the Internet with suspicion of a beast that appears to grow and multiply much like mythical beasts from ancient Greek lore.

#### Educational Technology

New uses for computers and their related programs often come about as a result of business practices. It is the goal of business to train individuals to be able to enter the workforce and be productive. If business was somehow able to have these individual workers trained prior to their entry into the workforce then time, resources, and money would be saved. What better institutions for training than schools in order to achieve this purpose?

Authors as diverse as Resnick (1987) and Dewey (1938) would argue that there should be compatibility between life and school. Resnick (1987) has found that

successful computer programs have five characteristics which are evident in the production of critical thinkers. These programs:

1. Involve socially shared intellectual work.
2. Are organized around mutual accomplishment of tasks, so that elements of the skills to be learned take on meaning in the context of the whole.
3. Make usually hidden processes overt and thus subject to explicit observation and commentary by participants and teacher.
4. Permit skills to be built up bit by bit, yet allow participatory roles even for the relatively unskilled. They thus enable learning by social sharing.
5. Are organized around particular bodies of knowledge and interpretation rather than general abilities.

In part because of the demands of business, educators have found that there needs to be a shift in curricula in order to reflect what is going on around them. Although most new curricula are being reviewed (Alberta Learning, 2001), most elements of curricular thought and practice are not so current and, in some instances, as Reiser (1987) generalizes, teaching practices harken back to the late 1800s. This makes me wonder if our teaching practices have evolved as much as our societies have evolved.

Although education has witnessed a multitude of both technology and innovation over the past fifty years (Reiser, 1987), the educational system has scarcely changed during that time. Few would argue that doctors and dentists of fifty years ago would be competent and capable

enough to practice with the technology of today. Yet, a teacher from fifty years ago would probably feel right at home in most of today's classrooms as most technologies and innovations introduced during this time have been discarded. (Hooper, 1995)

So what does this mean for the implementation of the newest curriculum, which is based upon the newest tools in education? Does the use of computer technology mean that the way that we have taught, successfully some would argue, needs to change? Some educational professionals might argue that many educational practices from the past are outdated and should not be used in regular classroom practice. While there may be elements of the older methods of teaching that are valuable and could still be used today, there is a growing expectation that educators should be embracing new tools for teaching and learning.

Educational reform means, in part, that old ineffective ways of teaching should no longer be part of the daily ritual of accepted classroom practice. Reform, however, does not mean that good educational practices should be thrown out. Further to that, not all reforms are necessarily better and some good reforms are never implemented due to the fact that teachers are not provided with sufficient opportunities to integrate theory into practice. This requires a change in the practice of teaching.

There are at least three components or dimensions at stake in implementing any new program or policy: (1) the possible use of new or reviewed material (direct instructional resources such as curriculum materials or technologies), (2) the possible use of new teaching approaches (i.e., new teaching strategies

or activities), and (3) the possible alteration of beliefs (e.g., pedagogical assumptions and theories underlying particular new policies or programs) (Fullan, 1991)

Perhaps the new ICT curriculum in Alberta will allow teachers to change their teaching practices, practices that may be outdated or ineffective. Little (1982) talks about improvement coming about as a result of a number of things. For teaching practice to change, no elements of the undesired practice should be included in any new practice. There must be a common framework for language, which must infuse professional conversations that have to occur not only in the classroom but also in the staff room where most teachers share their classroom experiences. There must also be a planned integration of new educational practice so that all staff members have a common goal towards which they can work. Of course, there must be a willingness by the staff to accept these changes or else the implementation of new strategies and practices will not succeed.

Alberta Learning, which is the educational department of the Alberta government, hoped that a grassroots approach to the implementation of new teaching practices would help to jump start education by enthusing teachers who complained that curricula was outdated and unrealistic in the real world. The Alberta Initiative for School Improvement (AISI) was created by Alberta Learning to fund these grassroots ideas, putting money back into education and investing in Alberta's future. The government provided millions of dollars in funding for school districts if they developed, implemented and reported upon new educational programs which supported Alberta Learning's curricula. When the Foothills School Division passed this information on to its schools, there was an

overwhelming response. Unable to provide support for all the requests, the Division grouped similar projects together and asked schools to create a universal plan that would best share the resources and available funding. Innovation in Art, Music, Math and Technology were some of the programs which were approved at the divisional level and then approved at the provincial level. Foothills School Division's four year AISI funding totals about \$800,000 annually and supports ten individual school and divisional programs, created by the teachers. It was hoped by many schools in the Foothills School Division, that curricular support related to ICT would promote better teaching practices in the area of technology. The ICT proposal generated the most interest from across the Division and it receives about thirty-eight percent of the AISI money.

Opponents of technology once again voiced their concerns over the disparity of funding in AISI programs. Proponents of the program argued that they needed the extra money if they were to create a model program of the kind that is currently working with success in the Foothills School Division (Hampshire, p. 11). Either way, a new curriculum had been developed and was beginning to move into the classrooms of the province. The method by which the new curriculum has been brought on line is not so dissimilar to Glatthorn's (1994) vision of "Mutal Accomplishment".

Mutual accomplishment, a concept introduced by Bird (1986),

Describes a type of implementation in which the developers of an innovation . . . (in this case Alberta Learning) . . . (change) the curriculum in a positive direction, and the users of the innovation (in this case the classroom teachers) accomplish their goals of influencing the specifics of the curriculum while retaining their

autonomy over daily life in the classroom . . . (It) is a sensible midpoint between top-down fidelity and curricular anarchy.

Once in the classroom, the teacher assumes a considerable degree of control over new curriculum. The introduction of new technology into everyday teaching practice is sometimes unnerving for teachers. With technology, some students may know more than their teachers, in which case the students may lead their peers and their teachers through some stages of the lesson. The metaphor for this new model of teaching is a *student-traveler* model, as opposed to a *teacher-guided or travel-agent administration* model. (Posner, 1997) It is difficult for teachers to let go of more traditional models, as they fear losing control of their class. Posner contends that if teachers have a supported curriculum implementation model in which they can practice such a new method of teaching, they will find that they gain more power and respect from their students as they empower the students with the need to learn rather than control the students and dictate their learning.

Constructivist Theory promotes a similar model of learning which includes “collaboration, personal autonomy, generatively, reflectivity, active engagement, personal relevance, and pluralism . . . where opportunities for learning activities in which students, instead of having knowledge ‘transferred’ to them, are engaged in a continuous collaborative process of building and reshaping understanding.” (Wilson, 1996) In this model, teachers provide the framework, based on the curriculum, with which the students will learn about the required concepts using their own terms of reference. This will give students a deeper understanding of the concepts as they have taken greater ownership in the obtaining and retaining of the knowledge.

### ICT and Global Education

“What kind of education will best prepare students for life in a knowledge society?” ask Scardamalia and Bereiter (1996). “Education should foster flexibility, creativity, problem-solving ability, technological literacy, information-finding skills, and above all a lifelong readiness to learn.” Educational institutions need to be able to turn these terms into educational objectives, however. As business leaders and educators debate the best way to create teachable global objectives, youth groups are meeting to tell adults how they feel.

Youth empowerment can be seen in the work which is being done by committees at the United Nations. During the period of August 6 – 10, the fourth session of the World Youth Forum of the United Nations System was held in Dakar. A number of recommendations were outlined by the over 300 students who were no older than 24 years of age. The decisions that were made at Dakar demonstrate the desire of international youth to be empowered. The recommendations were an attempt by young people to shape policy for youth matters.

Recognizing the impact of ICT on the ways young people learn, interact and participate in the emerging global knowledge information society, and in order to guarantee universal access to education at all levels, participants called for the establishment of an education and ICT fund to promote North-South and South-South cooperation. In order to close the digital divide, the Working Group called for measures to improve quality and access to education and ICT, and the use of ICT as a medium for dissemination of information about such important issues

as HIV/AIDS and environmental problems. (United Nations, 2001)

This does not seem to be a problem for developed nations to deal with but are the above recommendations realistic for the poor and developing nations of the world? As the world focuses in on the events unfolding in the Middle East, pictures from war-ravaged Afghanistan would have you think that there is a limit to what technology will be able to accomplish in such remote and harsh conditions. Yet the media is able to send information out of Afghanistan via new technologies which include satellite uplinks of voice and pictures recorded using a small, hand-held video camera. The only need is for batteries to run the small computer, about the size of a small brief case. If this is the case, then what other advances can there be to bring technologies to those communities that were considered inaccessible in the past?

Sugata Mitra is a researcher and developer at NIIT, a training and software company in Delhi, India. BBC Online News reports that the Indian Government, the World Bank and other local stakeholders have come together to see how the use of computers can combat the high illiteracy rate in that country. As with most good ideas, the principle was simple. He installed a computer in the wall of his office. The computer faced a slum. In very little time, the children of the slum approached the screen and without any assistance, they were able to use the computer and access the Internet.

What they would see is the opening screen of MSN.com.

They started fiddling around with the touch pad and quickly noticed that finger movements on the touch pad moved something on the screen. Very quickly, they discovered that the cursor changes to a hand shape when you bring it close to an underlined word and then

accidentally discovered that you can change pages. All this happened within minutes and so that by about the eighth minute they were actually surfing. (BBC News, 2001)

According to Mr. Mitra, the learned skills were either incidental or passed from child to child through peer learning. The experiment has been repeated in several areas of India and the results are almost identical. Children were able and willing to quickly learn to use the computers. Based upon this and my experiences in schools, it seems that the amount of ICT learning that students can acquire is limitless. The key to ICT integration is access. Those who regularly improve their ICT skills are those who are willing to play and go beyond the use of the computer as a word processor or a CD music or game-playing device.

#### Educational Policies for Technological Use

Computer use in the Foothills School Division is dictated by policy (H-426) which states that:

The Board believes computers and related technologies are capable of enhancing the learning experiences of students.

The Board believes that these technologies should be provided and integrated into schools, programs and service to achieve these goals.

- To enhance student learning in respect to: skills acquisition, creativity, problem solving and critical thinking;
- To ensure students become users of information

technology;

- To enhance curriculum engagement for students and program management for staff;
- To ensure cost-effective implementation and support of these technologies;
- To ensure equitable access to these technologies by students of the Division;
- To require the submission of an evergreen plan to the Board, subject to review and revision every two years.

(Foothills School Division No. 38, 1997)

The Foothills School Division (FSD) is located in Southern Alberta on the southern border of the city limits of Calgary. It extends as far south as Cayley, as far east as Blackie and as far west as Millarville. ([www.fsd38.ab.ca](http://www.fsd38.ab.ca)) As with all School Authorities in Alberta, the FSD is mandated by Alberta Learning to carry out all curricula as dictated by the government. School Authorities that do not follow this law, can be replaced and are subject to punishment under the law. (Alberta Learning, 2001) That being understood, there is still a lot of latitude in terms of how School Authorities and their employees implement the curricula. In terms of the implementation of the ICT curriculum, the School Authorities entrusts the executive or superintendent of the Division to ensure that all requirements are being fulfilled. Further to that, the Executive team utilizes the Learning Services Department which will liase between the schools and the Divisional office. Their mandate is to make sure that both groups know and understand what is to be going taught in the classrooms across the division.

Each school, in turn, must create a technology use plan for the school. This plan is a three-year outline of the goals that each school is hoping to achieve as it implements the ICT curriculum. As part of these growth plans, teachers and technical personnel are trained during professional development days at various times throughout the year.

Internet use and E-mail capabilities are provided for using a Wide Area Network (WAN) which utilizes wireless technology to speed up access. According to Doug Dietz, (personal communication, October 15, 2001) who is the supervisor of Technology Services for the Foothills School Division “all schools except colonies have Internet access. Colony schools do not allow us to put in Internet access.” I was also at the October, 2001 meeting of the Foothills Administrators Association (FAA) where Mr. Dietz stated that the use of Internet systematically increases at schools which are part of the AISI ICT program. This use seems to be related to the days in which schools were receiving support personnel from the AISI ICT team.

Every school has been provided with thirty computers to fulfill their ICT obligations. Larger schools have more than thirty computers which is based on a formula relating to their population. Either way, most schools purchase more hardware in order to fully maximize their computer technology base. Computers provided by the School Division are *Evergreened* or replaced every six years and any additional computer over and above the original thirty, purchased with school or community funds, will not be replaced at divisional cost.

#### Technology Use World Wide

According to an online article, An EUN Survey on ICT in Education Policies Around Europe (Langner,2000), the FSD is in line with, or ahead of countries in Europe.

Computer / Pupil ratios vary from a low of 30:1 in Italy to a high of 6:1 in Danish vocational schools. All secondary schools in Luxembourg are connected to a national backbone while only 40% of primary schools are connected. Finland and the UK have 80% and 90% of their schools networked respectively. Correlated statistics regarding teacher training cannot be found since teachers in the FSD take courses based on their school or personal growth plans.

It is not only schools that see the need to compete using IT. An article published by The Commonwealth of Learning (2001) states that “World leaders recognize that all citizens must have access to education and training if they are to be equipped to shape their own destiny and meet the social, economic and personal challenges of the global knowledge-based economy . . . governments have also recognized the need to look beyond the conventional model for providing education.” Every country in the world knows that the global economy is something that they need to be a part of, even if they don’t necessarily want to be part of it. I was watching Larry King interview a Pakistani newscaster tonight (November 12, 2001) and he reported that the Taliban leaders, who are at war with the United States, watched all kinds of American information programming, including Larry King, to develop their strategies for resistance. Fiber optics, wireless, and satellite links are all keys to working within this global economy but let us not forget that as we move through the 21<sup>st</sup> century, many of the elements that educators have been trying to prescribe for the educational system still hold true in an IT world. The Department of Employment Education Training and Youth Affairs (1997) stated that

The computer environment support all of the learning

advantages of play which have been recognized in early childhood programs for many year. . . like play, the computer provides an environment free from the fear of being wrong; it is intrinsically motivating; they can set their own goals . . . and make up the rules.

### Opponents of Computer Use

With the perceived increase in evidence to back up the positive outcomes resulting from the use of computers, it would seem that our society is prepared to accept the new technological millennium. However, is technology really the great medium that it is reported to be? Armstrong and Casement (1998) feel that

what has been lacking is serious public debate about the nature of this technology and what it should, or could, be used for in our children's education. Such a debate is all the more necessary because so many parents and teachers have been seduced by the blandishments of computer companies and software developers into believing that mastery of computer technology is key to their children's success.

During my research, I have found various authors that do point out the hazards that are associated with computer use. Even through the long hours of preparation required to complete a Masters project, I have suffered from some of the common overuse ailments that Sellers (1994) points out can happen from too much time spent in front of a computer monitor. Eyestrain, headaches, back strain, as well as shoulder and hand related injuries are common to those of us who sit in front of the computer for any length of time. These side affects are obvious but what about the effects of radiation from

computers? Sellers (1994) asks us to draw our own conclusions about the safety around the computer.

One argument voiced by some who have concluded ELF's [extremely low frequencies] are safe is that there has been no cause-and-effect relationship shown; no study has demonstrated how this radiation causes cancers or miscarriage. But others point out that proving a clear cause and effect often isn't always necessary for a substance to be regarded as toxic, as long as the other evidence is convincing.

For example, asbestos (a clearly toxic substance) was considered dangerous before it was known exactly how it killed people . . . But there are exceptions, like cigarettes, which are clearly toxic but are still legal.

As with any tool, overuse will lead to the wearing out of components needed to complete the tasks, be they machine or human. It is advised that regular breaks should be taken to ease the strain that the body is taking. Sellers (1994) supports the need for several minutes of break time each hour in order to move about, stretch and change body position. Physical breakdown is a risk that we endure with regards to any task that we might undertake but are there other areas for concern?

Social isolation is one of the discussions that come to my mind when talking about the ills of Society. The news shows stories of "loners" who had few chances for social interaction as they grew up and eventually they decided to carry out some act which was socially unacceptable. Computer use appears to be a solitary activity where individuals are stationed in front of a computer. The amount of time that is spent in front

of the computer varies but it is not uncommon for users to become so involved that they while away many hours of time without cause for thought. The same could be said for people who immerse themselves in books for hours at a time, seemingly oblivious to the goings on around them. In Armstrong and Casement's (1998) book *The Child and the Machine*, they reference Michael Heim who states that "Informania retards rather than accelerates wisdom" (p. 121). Based on this statement it would seem that the amount of information that is available on the Internet and that can be accessed in a short amount of time, means that the use of computers and the Internet are not helpful. I would assume, therefore, that books take longer to browse through and thus provide more wisdom as more time is involved using this medium. Hampshire (personal communication, January 21, 2002) stated that

the internet can deliver a fire hose of information about anything with unprecedented speed. Yet it is still merely information.

It is relatively meaningless unless applied to a learning context, to increase understanding, or to solve a problem. There is certainly no shortage of information. The question is what is it useful for?

Clark's book, *Computers and Young Minds* (1986), supports the use of computers in education. As a proponent of computer use in education, it may seem odd that he goes on to discuss the fact that computers can do damage to children as well as adults. This damage is not physical, as Seller discussed but rather he feels that computers can be mentally and socially damaging.

Computers are bad . . .

- when they allow little or no room for the expression and

growth of values and feelings.

- when they divide children into groups. Expressions such as nerds, hackers, wirehead, and technoids come to mind.
- when they are forced upon children whose personalities just don't fit in with that line of thinking, regardless of the approach used.
- when opportunities for hands-on experience are at a minimum.
- when their limitations are not explained to children.
- when they are put on display as a stand alone product. This is the micro-approach to microcomputers.
- when they are set up as models of how to think.

In *Children and Microcomputers*, Paisley (1985) cited studies by Riccobono (1984) and Becker (1983) in which computer programming was taught more often in predominantly white schools as opposed to minority schools. Paisley (1985) also cited a study by Liberman (1984a) in which computer use by males increased as they grew older while females actually used computers less often. This statistic varied depending on the socio-economic situation of the individuals in the study.

The actual physical location of the computer lab may also lead to increased use or disuse depending on the proximity of the classroom that is using the computer lab. In my school, some classes don't even attempt to gain access to the computer lab during the recess periods as they know that by the time their students travel down the hall, the computers will have all been occupied. In terms of the computer lab itself, Armstrong and Casement (1998) also state that "computer technology requires more classroom space

than traditional teaching approaches. In 1970, an average elementary school provided . . . (5.76m<sup>2</sup>) per student. In 1995, the average space per students was . . . (10.32 m<sup>2</sup>)” (p. 37). Armstrong and Casement (1998) cited the American School and University magazine which reported this fact in their annual report and attributes the doubling in class size to technology requirements in the classroom. As with any increase, be it space or objects to occupy the space, there is going to be a dollar figure attached to it. This is where opponents of computers have the most tangible evidence to support their views that computers are not helping the educational system.

School technology spending has also been proceeding apace in Canada. British Columbia spent \$40 million between 1992 and 1995 to upgrade its systems, and plans to spend another \$60 million by the turn of the century. Ontario spent upwards of \$150 million over the same three-year period. (It is very difficult to get exact figures on the amount of money spent on technology, since so many schools receive corporate gifts to get them started.) These expenditures cover new computers, printers, and software; they do not include the yearly maintenance costs that will be required if the equipment is to be kept in good working order. (Armstrong and Casement, 1998)

The money for technology has to come out of budgets which are not increasing in relation to the demands of education. As an educator, I see provincial governments in Canada continuing to cut educational budgets while they promote special capital projects in which funds are earmarked for use only in the designated spending area. Because of these general cutbacks, areas of education are being eliminated to help pay for

technology. These include teaching positions in art, music, physical education and teacher librarians as well as educational assistants for the classroom. “The New York Times recently reported that a school district in Des Moines had eliminated 104 jobs . . . while obtaining \$2 million in state funding that was earmarked for technology purchases” (Armstrong & Casement, 1998, p. 38).

Campbell and Fein (1986) conclude that “we are in a state of uncertainty concerning the impact of microcomputers in the education of young children . . . Many important questions need to be framed and investigated regarding the match between goals for children and computer education” (p. 56). It appears that many people have committed our future to the increased use of technology in our daily lives. Over the next century, we will be able to look back and assess the success of technology in our daily lives. This is the first generation that will have full access to technology from cradle to grave and although we can anticipate the result of this technological inculcation it is not hard to imagine that the outcomes will far exceed even our wildest expectations. Will they be dreams . . . or nightmares?

#### Summary

Technology, and more specifically computer technology, has advanced over the last thirty-five years. It is hard to imagine a massive room in 1945, filled with row upon row of equipment, countless numbers of vacuum tubes and a multitude of people scurrying about as they tried to complete, what to us today, would seem like simple mathematical computations. Today I sit in front of a computer that is thinner than the textbooks used to describe its capabilities, yet at the same time current technology has

already made this year-old computer out of date. The speed at which we can now work, would seem unfathomable to the founders of the computer world.

It is because of the efforts of the women who were the programmers of the ENIAC computer and the entrepreneurial spirit of leaders such as Jack Kilby, Charles Tandy and Jack Tramiel, that we are able to stand at the leading edge of a revolution which is unprecedented in its impact on the world. Tools for war have become tools for commerce in a global economy. Molnar (1997) described the changes which occurred in the mid 1970s, allowing for large time-shared systems of computing to be shifted, creating room for the advent of the personal computer.

The personal computer allowed users the freedom and individuality that really seems to be the strength of the computing age. At the same time, however, individuals such as Ted Nelson saw the need to combine all of the advantages of computers into one forum for all to use. This forum would be a database where information would be gathered to be used by everyone in the world, to benefit mankind. Either by a directed mandate, coincidence or plain dumb luck, it came to be that technology has become a universal tool without limitations of time or space or user.

Schools have also been affected by the growth in technology as stated by Rossman, Corbett and Firestone (1988) since they feel that schools reflect society's cultures. Almost every school seems to be straining to compete and work within the ever-evolving world of computers. I have seen skills which were taught to junior high and high school students, now being handled quite capably by students as young as kindergarten. As the need to gain more information grows, students have greedily slurped up information, which is readily available on the World Wide Web. In 1995 the Web or

Internet was born and since then its capabilities have multiplied at a rate that even diseases would marvel at. Both teachers and students have grown wary of the sites which either provide poor information or are pornographic traps for the uneducated surfer. At this point and time there is no way to substantiate many of the materials that are on the Web and therefore a secondary lesson has been learned as users become Web-savvy. Law enforcement is beginning to search for sites which are not appropriate for students as well as Society in general. Much like the information that is on the Internet, sites can become quickly outdated and the predators and those who endeavour to misinform, move on. It is a game of cat and mouse and as teachers learn more about the weaknesses of the system, they also become stronger in their ability to educate their students about technology's benefits and detriments. It is this lack of direction that causes opponents to wonder about the worthiness of computer-based education. Why should we chance encounters for students to access sites which are dangerous or misinformed?

As learning occurs, it has forced many teachers to look at their teaching practices in a manner that they have not had to in the past. Some students spend countless hours on their home computers and as they play they become adept at many skills associated with computer use. Teachers must adapt to this new classroom model of management if they hope to be effective educators in the new millennium. Those staff members who cannot reinvent themselves are at risk of losing their teaching positions. Even those staff members who are current with many of the trends in technology, are at risk of being consumed by the nature of the technological beast. Because of their interest in technology, staff members end up in positions where they must manage the computer systems, provide repairs and do other related or perceived related jobs. This leaves little

time for quality planning and even less time for interactions with students, opponents would argue.

Opponents of curricular change also point to exorbitant costs for start up, maintenance and upgrading of the computer systems which reside in most schools. Limited numbers of computers and access to computers puts many students at a disadvantage where, it would seem, computer savvy teachers are monopolizing the limited resources.

Computers appear to isolate student interaction as one student sits at one computer and works in isolation from their peers and even their teachers. Campbell and Fein (1986) would argue, however, that their studies have shown that with appropriate software and an established classroom routine, students show increased cooperative and collaborative interaction. Clark (1986) would agree with Campbell and Fein, yet he does see that there are opportunities for students to become harmed without proper pre-teaching and supervised skill building, using technology. Proponents of computer use would argue that the same would apply to teachers who are ill prepared for the regular classroom.

Technology and computer technology have come a long way in a very short time. Depending on your views, there is a lot of information to back up arguments that you may have for or against technology and technological use in education. It appears that no matter what your viewpoint is, debate must continue to ensure that all of the questions that need to be asked have been asked. Well justified answers must also be provided by proponents of technology if we are going to continue down the uncharted path on which we are travelling at an unprecedented rate. It is only through informed discourse that the

best elements of technology can be harnessed and used for the benefit of our society.

## Chapter Three: Method Proposed for the Project

### Background to the Methodology

For the purpose of this study, I proposed to conduct an inquiry-based qualitative study. Creswell (1994) defines such a study using time and activity (a program, event, process, institution or social group) whereby a variety of data collection procedures occur over a sustained period of time. I further refined this study based on Spradley's (1980) ethnographic research. He states that "ethnography is the work of describing a culture" (p. 3) and the culture which I was looking at was school culture and the AISI ICT project. After selecting an audience, I selected my thesis based on the interests which I had already developed during my current teaching practice. I then created a list of topics and created an outline as part of Leah Fowler's Writing educational research ED 5410, at The University of Lethbridge. Various rewrites have taken place since the research has been completed and the finished product stands before you now.

### Methodology

The implementation model, which the Foothills School Division's AISI ICT project is using, is a new and successful way in which to implement curricula. This is the view which I proposed to prove based on the data which I had collected through surveys and personal interviews with staff member of the Foothills School Division. In order to do this I selected four teachers from Blackie Elementary School and four teachers from the Right Honourable Joe Clark School, to be the subjects for a survey and personal interviews. Both schools have been involved in AISI projects in the Foothills School Division. However, these projects have not necessarily dealt with technology. Teacher subjects from Blackie School had been involved in the ICT project

for over a year while Joe Clark School teacher subjects had no experience with the ICT project. I have referred to Blackie School teacher subjects as *Experienced* and Joe Clark School teacher subjects as *Non-experienced* in terms of their knowledge of the ICT AISI project. I had planned for two male and two female teacher subjects to be interviewed from each school but Joe Clark School only had one male teacher subject available to interview. Because of this fact, Joe Clark School had three female teacher subjects and only one male teacher subject to be interviewed for this project. Of the four Experienced teacher subjects from Blackie School, two were teaching in Division I and two were teaching in Division II. The four teacher subjects from Joe Clark School include two teacher subjects who were teaching in Division I and two teacher subjects who were teaching in Division II. All teachers subjects have had experience teaching at either Division I or II.

Beginning on the last week of September, I contacted the schools to set up times for conducting the survey and interviews with the teacher subjects. The time of the meetings was to occur after school based on availability of the staff members. The final arrangements were made during the first week of October and interviews began shortly thereafter. Arrangements for a testing area were also taken care of during the initial meetings.

Meetings with the teacher subjects occurred individually and the purpose of my research was not discussed prior to the meeting, other than to acknowledge that it was part of my final project. Each meeting lasted thirty minutes.

The survey consisted of ten questions (Appendix A) which probed areas of understanding such as the division level that the teacher subject was currently working at,

technological background of both the teacher subject and their students and their feeling towards the implementation strategy for the ICT curriculum. The personal interview questions (Appendix B) consisted of fourteen questions which were designed to illicit direct reflections on the ICT curriculum and its implementation.

The survey and interview tools were chosen for the following reasons:

1. A survey easily identified a respondent's attitude.
2. Confidentiality of responses to the survey questions could be ensured.
3. A survey allowed for respondents to freely express their responses without interference.
4. Research with regards to surveys indicates that they have been an effective tool for obtaining information, providing effective road maps for researchers. (Denzin & Lincoln, 1998)
5. A survey reduced personal influence from the researcher.

Teacher subjects participating in the survey were given specific instructions regarding the completion of the survey. They were also asked to indicate their desire to participate in a personal interview. The teacher subjects were informed that their responses to the survey and interview questions were strictly confidential and their names would remain anonymous. The directions for the survey were minimal so as to eliminate any influence. The survey took ten minutes to complete and at the completion of the survey, the teacher subject participated in a twenty-minute interview. The interview was recorded and later transcribed.

At the completion of the meetings with the teacher subjects, I evaluated the materials which were collected. I tabulated the results from the surveys and placed them

on graphs (Appendices D - X). I also transcribed the dialogue from the personal interviews. I completed all of the work by the end of October and submitted my final project in December, 2001.

I am confident that this style of research best suited the investigation of implementation strategies for the ICT curriculum. I feel that this research will help to guide other schools when it comes time to implement their own ICT curriculum. At present, I am at a school that is yet to be part of this ICT implementation model and I feel that this school community will benefit from the implementation of the ICT curriculum, with divisional and AISI funded support.

The literature reviews include documentation provided by Alberta Learning, Telus 2Learn, Galileo, North Central Regional Educational Laboratory (NCREL), and other institutions, directly related to work with ICT curriculum implementation. I also reviewed books and articles which addressed curriculum implementation as a whole. The use of the World Wide Web was an important tool with which to find current information on ICT integration. At the beginning of this research, it was difficult to find information using the term ICT as a keyword in the search. The term ICT did not appear to be universally recognized and therefore searching for related articles was more difficult. In the last six months, however, there have been more links available to researchers, as ICT becomes a more common acronym. The literature on computer integration is mostly written from the early 1960s until the present although I was able to collect current information on ICT and curriculum implementation. It was preferable to have information published in the last five years.

A lot of preliminary work was completed prior to planning for the teacher subject meetings in October. After planning and drafting my survey and interview questions, I asked two of my colleagues to share and discuss their views of the questions which I was proposing to use in my study. Through a process of elimination, revision and editing, I finalized the ten survey questions and fourteen interview questions that I used for this project.

With regards to the survey and the personal interview, I was aware of shortcomings, which occur with such a small sample, and I discussed these apparent difficulties with Dr. David Townsend, my advisor. Hittleman (1992) cited Borg and Gall (1983) in his description of the importance of using larger samples where possible, but if this is not possible then there must be every effort made to ensure that the statistics gathered from the sample group are free of errors because:

- the size of the sample is important for statistical reasons.
- generalizations from smaller groups are more likely to have statistical errors.
- the larger the group, the more reflective the sample of the target group will be.

A small rural school has a small student population and, conversely, a small teacher population, the likelihood of getting a large random sample is slim at best. In this project I had selected 40% of the teaching staff for my study but I felt that I needed to use another group for the study. I selected a school which was not an Orbit School as of yet. This school was a K to 5 school with about the same ratio of male to female staff, between 12 and 13 percent, which was the same as the first school selected. This school has about 330 students in it. During the selection process, however, I was not able to get a 50:50 ratio of male to female teachers. After selecting the teacher subjects, some teacher

subjects were working in different divisions than I had initially anticipated. The fact that they had taught at the other division levels made me feel secure in the fact that I had a balance of division I and division II teachers, although they were not necessarily working at that division level this year. Overall, I also attained a male to female ratio of 3 to 8, which works out to 37.5% of the subjects being male. This is somewhat higher than my estimates of the divisional percentage of about 12% – 13% of male teachers working in elementary schools. Because both schools used in this project were small, all attempts were made to ensure that the sample was free of errors when the statistics are compiled.

Also, due to the constant evolution of teaching roles in a small rural school, I was unable to guarantee a sample of teachers with current assignments at the Division I and / or Division II level. Staff members of the case sample school do have experience teaching at those levels, even if that is not their current assignment. I could also not guarantee that half of the test subjects were male and half of the subjects were female. Generally, females outnumber males in elementary school settings in the Foothills School Division.

A personal interview was also conducted with each of the four teachers from the case sample schools. These interviews were taped and transcribed. The information gathered from the interviews were included in the final research submission. The interview provides an opportunity for the researcher to gain insight from the respondents on a more personal level. The interview questions were designed to elicit responses that confirm or deny the hypothesis that the implementation model being used by the Foothills School Division for the ICT curriculum is a more effective manner in which to successfully implement new curricula.

Whyte (1984) discusses areas that interviewers need to be aware of when they are conducting personal interviews. In this case, I needed to be aware of my former association with staff members and make sure that I was conducting myself as a covert participator rather than an overt participator. In planning the interview I consulted the chapter on Interviewing Strategy and Tactics to understand the role of the interviewer. This includes:

- Nature of the interview
- Focusing on events
- Specifying process
- Stages in interviewing
- Recording the interview
- Indexing
- Evaluating interview data

It is not difficult for the interviewer to bias their research by imposing their views, either overtly or covertly. This is a consideration that I was very aware of and one, which I hope, did not compromise the results of the interview.

In discussing the methodology used for this proposed project my colleagues and I from the Foothills Cohort came to the conclusion that Patterson's (1993) assumption that teacher-researchers are unique individuals is a valid point. We, as teacher-researchers, are constantly trying to make sense of our experience in order to make good decisions about classroom practice. He states that by nature this process is organic, sometimes messy, unpredictable and generative, just like teacher's lives in and out of school.

### Conclusion of Methodology

I, as researcher, did the analysis of the data. The data was compiled and reported to my supervisor and presented in this, my Master's final project document. I feel that the results will assist the ICT implementation team in the determination of the success of the ICT project within the Foothills School Division. Discussion generated from this project will hopefully assist other future implementation teams in the development of their curricula implementation models.

The majority of professional staff are increasingly interested in what ICT has to offer them for enhancing/enriching student learning across curricula. ICT workshops are very well received and professional collaboration is enriched as teachers plan & discuss projects. Students are increasingly comfortable and proficient with using technology as a learning tool and benefit from the capabilities of software applications that provide them with an alternative medium of representing their understanding (e.g. PowerPoint, Excel, html). (Hampshire, 2000)

The survey data is presented using bar graphs. Each question from the survey has been placed on the graph with the data collected from each question placed beside each other so that differences in responses can be gauged clearly and concisely (Appendices D - X). Due to the size of some of the graphs (Appendices L, X), abbreviations had to be used in order to fit these graphs onto a single page (Appendix C).

The Interview data has been transcribed and the transcripts were coded (Appendix Y) and displayed based on categories which included among other things, how additional staffing was used, examples of how staff appeared to be more focused on ICT initiatives

and system problems that teacher subjects encountered while using technology. The transcripts and transcript coding are displayed as part of the final project report.

We use interviews to find out (A) what has been going on in the experience of the informant and (B) how the informant feels about those events, about other people and organizations important in these events and about him- or herself. It is important to relate A with B, event with sentiments or attitudes. If we do not, we are left with a picture of sentiments floating in the air with no connection to personal experience. (Whyte, 1984)

## Chapter Four: Analysis of Results

### Program Premise

Foothills School Division is one of many districts in the province which is participating in the Alberta Initiative for School Improvement. Currently, Alberta has over 731 AISI projects. In my project, 87.5% of the entire sample group of teachers knew what AISI stood for. 75% of the Experienced school teachers knew what AISI stood for while 100% of the Non-experienced school teachers what AISI stands for. This is not because they are aware of the ICT component of this project, but because AISI is a program that covers many areas of curricula in our division.

\$68 million will support the Alberta Initiative for School Improvement (AISI). Now in its second year, AISI encourages teachers, parents and the community to work together to introduce and share proven innovative and creative initiatives to improve learning. AISI promotes a culture of continuous learning and improvement. (Alberta Learning, 2001)

ICT or Information and Communication Technology is defined as: how to use and apply a variety of technologies, and the impact of ICT on one's self and society. Students in Kindergarten through Grade 12 will be encouraged to grapple with the complexities, as well as the advantages and disadvantages, of technologies in our lives and workplaces. The ICT curriculum is not intended to stand alone, but rather to be infused within core courses and programs.

Technology is best learned within the context of applications.

Activities, projects and problems that replicate real-life situations are effective resources for learning technology. Students will learn:

- that although technology is often complex, it is simply "a way of doing things".
- about the impact of technologies in their lives and workplaces.
- how to determine which processes, tools and techniques to use, and when to use them.
- how to use and apply a variety of information and communication technologies to problem solving, decision making, inquiring and researching in the context of other subject matter.

Technology will serve today's students well in entry-level work and beyond, in further study and lifelong learning, and in their personal lives as inquisitive, reflective, discerning and caring citizens... ICT is significantly enhancing and altering human activity, and enabling us to live, work and think in ways that most of us never thought possible...

(Telus 2Learn, 2001)

Based upon this premise the AISI ICT project was developed. Foothills School Division accepted applications for projects from teachers across the division and out of those applications, some individual projects and some large cross-divisional projects were chosen. The ICT appeared to be the most popular among teachers in the division and this probably correlated to the fact that the new ICT curriculum was due out within a year. A group of teachers, including myself, volunteered to develop the plan on which AISI ICT would be created, deployed and reviewed for effectiveness.

After a couple of planning sessions, there was agreement upon the way that the project should be shared amongst the schools. It should be similar to a stone which is thrown upon a pond. The action would happen at the initial contact point and from there the effects would ripple outwards. Each of these hypothetical ripples would be called an Orbit and in all, there would be three Orbits which would fit in with the three year funding schedule set out by Alberta Learning.

The Foothills School Division had already teamed up with the Galileo Educational Network in the previous year. They had been doing some work with Dr. Morris Gibson School ([www.webacc.fsd38.ab.ca/schools/Gibson](http://www.webacc.fsd38.ab.ca/schools/Gibson)) and were therefore able to roll their projects over into the new AISI ICT project. Galileo's participation helped to mold the framework for AISI ICT project, allowing for funding from Galileo to mesh with funding provided by Alberta Learning. According to Galileo's website (2001):

The Galileo Educational Network is a professional development and research initiative focused on the fundamental changes to teaching, learning and staff development that information and communications technology both requires and enables.

The Galileo Network provides and supports transformational leadership in information and communication technologies (ICT) implementation in Alberta and internationally. Galileo's teachers work (1) on-site to provide coaching and mentorship to classroom teachers and administrators that demonstrate new images of teaching, learning, student capabilities and staff development, (2) on-line to share new images of schooling and sustaining face-to-face initiatives at

www.galileo.org, and (3) on-target, remaining firmly grounded in current educational research and contributing to research with a peer-reviewed publication program. The Galileo Educational Network has developed a number of strategic alliances with private, corporate, community and government organizations in order to operate autonomously from any one school district or division, and to pursue their province-wide and international mandate. (Galileo Educational Network Association, 2001)

### Findings of the Surveys

The surveys were based on the ten questions which the test subjects were asked to fill out prior to the interviews. The questions (Appendix A) were completed and the results were assessed. The results were compiled and are presented below. Hampshire (2002) is the project administrator of the Foothills School Division's AISI ICT Project. They presented their Year One Steering Committee Report on November 28, 2001 (Appendix Y). Where possible, data from their report will demonstrate similarities and / or differences between the two research groups. The AISI ICT Project selected "94 teachers in 7 schools, who were involved in their first year of the project [using a] locally developed survey instrument" (p. 3).

In this project, each question was grouped as either an Experienced school or a Non-experienced school in terms of their involvement with the ICT project over the last year. Each question was then tallied and based on the division which the respondent taught at, Division I or Division II. These totals were then graphed and the results disseminated.

1) What division / level do you primarily work at?

Seventy-five percent of all surveyed subjects are teaching in Division I this year. (Appendix C) 50% of Experienced subjects teach in Division I this year while 100% of Non-experienced subjects teach in Division I this year.

2) Have you ever worked with another curriculum implementation team during your career as a teacher?

Seventy-five percent of all subjects have worked with other curriculum implementation teams. Of the subjects that have, 66.6% in Division I and 33.3% are in Division II. (Appendices D, E) 100% of Experienced subjects have worked with implementation teams while 50% of Non-experienced subjects have worked with implementation teams.

3) As of September 1, 2000, how would you rate your technology skills?

Of the Experienced subjects, 50% felt that they were average and 50% felt that they were very good. Non-experienced subjects had 25% who felt that they were average and 75% of the subjects felt that they were very good. (Appendices F, G)

4) As of September 1, 2001, how would you rate your technology skills?

One hundred percent of Experienced subjects felt that they had very good technology skills. 75% of Non-experienced subjects felt that they had very good technology skills. (Appendices H, I, J)

Goal 1 of the AISI ICT Project report was to “facilitate adult learning to allow teachers to more successfully implement the ICT Program of Studies in their schools. According to their results, 46% of the teachers felt that “ICT had a significant to high impact upon their professional practice” (p. 3).

This project showed a 50% growth in the number of teachers who felt they had very good technology skills over a similar time period from 2000 to 2001.

- 5) How would you describe the level of technical expertise of your students, on average?

Seventy-five percent of the teacher subjects from the Experienced school felt that their students had average technical skills. 25% of the teacher subjects felt that their student's technical expertise was very good. 25% of Non-experienced subjects felt that they students had weak technical expertise, 50% had average technical expertise and 25% had very good technical expertise. (Appendices L, M)

Although Goal 3 is related to “an increase [in] students’ ability to perform the Assessment Tasks provided by Alberta Learning” (p. 4), I feel it does relate to students technical skills. In the AISI ICT Project report, teachers were asked to “estimate the students ability to perform the ICT Program of Studies Assessment Tasks” (p. 4). A baseline target of 21% was estimated by the teachers with a 5% proposed increase in the students’ abilities to perform the assessment tasks. Between September 2000 and June 2001, there was a 43% increase in the students’ estimated ability to perform the ICT Program of Studies Assessment Tasks.

The teacher subjects’ from this project estimated that 50% to 75% of their students had average technical skills. Although these skills are not directly linked to the ICT Program of Studies Assessment Tasks, I feel that there is a strong link between the the two sets of statistics.

- 6) To what extent do you understand what ICT (Information and Communication Technology) is about?

Seventy-five percent of Experienced subjects felt that they had an understanding of ICT that was moderately well. 25% of the subjects felt that they knew it a lot. Of the non-experienced subjects 25% understands ICT very little, 50% understands ICT moderately well and 25% understands ICT a lot. (Appendices N, O)

- 7) How would you describe the level of curricular support for implementing ICT in the district? (E.g. textbooks, handouts, curriculum guides)

Fifty percent of the subjects in the Experienced group felt that divisional support was adequate. The other 50% felt that there was lots of support. The Non-experienced subjects had 50% of the respondents feeling that curricular support was very limited and 50% feeling that curricular support was adequate.

(Appendices P, Q)

- 8) How would you describe the level of curricular support for implementing ICT in your school? (E.g. textbooks, handouts, curriculum guides.)

Fifty percent of the subjects in the Experienced school felt that school support of the ICT curriculum was adequate and 50% of the subjects felt that there was lots of curricular support in the school. Seventy-five percent of the Non-experienced subjects felt that there was adequate curricular support and 25% of subjects felt that there was very limited support for ICT curricula in their school (Appendices R, S)

- 9) How would you describe the level of technical support for implementing ICT in the district? (E.g. workshops, special guest presentations, staff or divisional personnel on hand to help with problems)

Fifty percent of the subjects in the Experienced school felt that divisional technical support was adequate while the other 50% felt that there was lots of support from the division. 50% of Non-experienced subjects felt that there was very limited support while 50% felt that there was adequate technical support from the division. (Appendices T, U)

10) How would you describe the method by which your school is implementing the ICT curriculum as compared with the implementation of other curricula? (Check as many as appropriate)

A total of eleven responses were registered in this question. Seven out of eleven, or 64% of all the subjects felt that the implementation model used by the AISI ICT team from the Foothills School Division was an effective method to implement this kind of curriculum. Only one subject response reported that it was ineffective, one subject response stated that it was confusing and the other response said it was comparable to other implementation methods. Nine of eleven responses were from Division I and II subjects while Division I subjects responded that it was ineffective or confusing. (Appendices V, W)

#### Findings of the Interviews - Strengths

Statements reflective of the teachers' interview responses (Appendix X) were divided up into sixteen areas of focus. Based on my interviews, teachers appeared to enjoy working within the AISI programs. One teacher subject felt that it gave them "an opportunity to learn at the ground level . . . (and they) didn't have to go and take another course elsewhere, it was offered at the school." It was evident that the AISI ICT program was well received by the Experienced school teachers. The fact that there was continual

support, including an on-site person, which made staff members feel that they wanted to learn more and therefore an incredible amount of learning went on. Hampshire (personal communication, January 21, 2002) explained that “these selections were by design, and provided some initial credibility and assurance for staff, helping us [Foothills School Division’s AISI ICT project team] to be viewed as knowledgeable colleagues rather than ‘techies’ or the ICT police”.

This model allowed for experienced teachers to learn both about technology and curriculum. One teacher subject felt that “it was successful because it gave time for staff to learn to practice and then put into use. To have an on site person . . . gave us time and that was a tremendous difference in all the different new curriculum implementation that has gone on.” Many felt that it was a personal journey rather than a mandated task and because of that; they were more apt to put in more of an effort which resulted in greater infusion of technology into the regular classroom routines. “I really liked the hands on approach of, uh, having school time available to work on it; and I made good use of that time”, said one teacher subject.

Time was also afforded to the Experienced teacher subjects and this time was set out during the school day with substitute teachers being used to cover class time. Teachers were still responsible for planning in the classroom, even though the extra planning is often a common complaint amongst teachers, but they did not appear to mind as they had more of an investment into this project than they have on other professional development activities which are often held after school or on designated days. A support person was also available once or twice a week to answer questions and that reflected back to direct infusion into classroom lessons rather than teachers having to wait until the

next workshop, which are usually set up four times a year in the division. A teacher subject commented that “you go off to your PD day with fifty other people and you do more general kinds of things together.” This kind of PD experience usually meant that the teacher subject was unable to apply the learned skills to their specific situation either because they had forgotten the lesson by the time they had come back to the school or they couldn’t make it apply aptly with the technology that was available in their own school. The benefits were seen and appreciated by the Experienced teacher subjects and they appeared to have a direct impact on students learning. Hampshire (personal communication, January 21, 2002) added that “Orbit 1 teacher surveys indicated very strongly that teachers saw improvements in the quality of student work”.

Based on Experienced teacher subject observations, students had an increased awareness of information gathering abilities where they would choose appropriate communication formats. This information was presented in continually more complex manners and was integrated across the curricular areas. Examples of student growth in the experienced school, in technology, include a CD school yearbook, digital camera use and downloading of pictures by the students, graphing, publishing, and presentations using Power Point and Excel. One teacher subject stated that “we’ve used the digital camera and the kids last year . . . knew how to use it and they can use discs to . . . get things off . . . to make graphs for their portfolios . . .” Students in the Non-experienced school were also working on projects, which included the aforementioned applications and hardware, but not to the degree that is seen in the Orbit 1 schools, according to Doug Dietz, supervisor of Technology Services in the Foothills School Division. Students were also

using the computer systems in a more effective manner such as storage of works on the Common “I” Drive which is an area where all students and staff can read, retrieve, edit and post materials in an open forum. Teachers in both Experienced and Non-experienced schools discussed the fact that kids are motivated to use all aspects of technology which can be seen through their enthusiasm, their willingness to share their discoveries with teachers and even teach their teachers some of the skills which they have developed. One teacher subject said that they were “amazed at what the kids know about computers.” Their growth is “evident all the time whenever you take kids to a computer lab, you see the difference.” Kids that are good with the computers are motivated to learn more and they peer mentor, which brings other student learning along. Some teachers felt that students are more “open ended” when they think about technology and that their time on computers is more efficient. Authors such as Dr. Sam Vaknin (2001) discuss the Solow Paradox whereby economies of the world are actually slowed down due to the relearning and rethinking of the economy with computers. This may be so today but the students that are using technology today will not have the same learning curve which we are facing today; one that we are continuing to develop. “In hindsight, 20 years hence, we might come to understand that computers improved our capacity to do things differently and more productively.” If this is the case, then it makes sense that our teachers are seeing the future and that they really are more efficient than we are, at this point in history.

#### Findings of the Interviews - Weaknesses

As with any new program, however, there are going to be growing pains and obvious blockades to progress. Teachers who have been working and associated with ICT

find that as they learn, they need to expand the capacities of our local school and divisional computer systems, software and hardware. “In order for us to get involved with ICT it requires larger equipment, better equipment and the hardware to complement what we do . . . and tech support because of the high technological need of this new hardware we need support in keeping it functioning” was the feeling of one teacher subject. Alberta Learning’s ratio for computers in schools should be set at about a 5:1 ratio. Doug Dietz (personal communication, October 15, 2001) who is the supervisor of Technology services in the Foothills School Division stated, “Alberta Learning gathers statistics which do not allow us to include 486’s and thin client, which makes our ratio fairly high.” This statistic varies from school to school but if you were to include all computers in the school division, Dietz says that the ratio is about 7:1. ICT requires larger equipment, better equipment and the hardware needed to compliment what we do. This includes more computers and hardware in the schools. In terms of systems, teachers are frustrated by the lack of technical support to aid in the computer systems being up and running. When this does not occur, projects cannot be done as too many glitches frustrate both the students and the teachers. Although this is not part of the project, it is a consideration when trying to mandate programs in schools. Further to this, Hampshire (personal communication, January 21, 2002) states that

you must have a reliable IT platform with robust software tools available in a ratio of at least 5:1. If not, many of the outcomes may not be attainable. Further I would argue that Alberta Learning has a responsibility to adequately support school districts in building their IT infrastructure via targeted grants, just as they do for texts, etc.

Aside from hardware concerns, experienced and non-experienced teachers feel that time is a major consideration for implementing this new curriculum. Teacher subjects commented on the need for more time by saying that:

- 11) (support) was (only) available for 20 minutes for me throughout the whole year to work with my kids.
- 12) We sort of were introduced to what other staff members were doing . . . we weren't given an opportunity to learn how to do that.
- 13) It would be nice if during staff PD activities, if we had kind of like a sharing time or each staff meeting . . . one person shared an idea or something.
- 14) I think we still need to have time to practice the skills.

On the other hand, some teachers did not take as much advantage of the AISI ICT project team as did others. This fact may have left some teachers with the feeling that they did not receive as much time related to the project, as did others.

Once new skills were developed by the AISI ICT support personnel, continual practice time was required by the experienced teachers in order to fully understand the tasks, difficulties and/or ease that may come to students at various parts of certain projects. Both school groups felt that students need to spend more time on the computers, which were sometimes complicated by lack of scheduled yet flexible computer lab timetabling. One teacher stated, "that you can only do so much with kids because of time restrictions."

One immediate shortcoming which came out of the Orbit 1, or experienced school was the fact that once they had been immersed in this program for a year, that they were not getting as much support this year and that "not surprisingly, some of the focus has

fallen off.” This fact seems to get back to the teachers however, and it should be noted that teachers need to continually work at including technology into their teaching practices on a daily basis. My understanding, which developed out of this study, was that teachers need more time to share and that this should be an expectation from administration and even from divisional office. This would put more onus on the teachers and perhaps this would help to alleviate some of the apathy associated after the focus on ICT had left the school as a primary focus.

These kinds of statements reflect the difficulties with workshop integration in that teachers who are not constantly reminded about using and integrating technology, or any curricula, into the classroom are very likely to forget about it and go back to teaching behaviours that they are more comfortable with, even if those practices are poor. So what does this tell us about AISI ICT?

## Chapter 5: Summary and Conclusions

### Summary

It appears that AISI ICT is has allowed for a more versatile form of implementation for the new ICT curriculum. Teachers feel that ICT and AISI go hand-in-hand and that this is the most support that they've seen for any curriculum implementation model in the past 20 years. Is this because the government is seeing some new insights into learning? Perhaps not! The Foothills School Division, along with all of the other schools who are working on AISI projects, has a lot invested in this program. This is almost \$1 million in funding which is going to help our students to receive the best education that they can. So perhaps it is being successful because of the amount of time and money that is being invested in the programs. As was mentioned by Tony Hampshire (2001) earlier in this paper, Alberta Learning has increased the program from three to four years which helps to demonstrate that it is more than just teachers and students who find that this program an effective tool for increasing student learning.

Schools and the division need to find ways to put the students in front of technology more frequently. To most people, ICT means computers but in actual fact ICT is any form of technology that can be used in classrooms to improve student learning. Kemp and Smellie (1994) feel that "instructional technologies refers to audiovisual, electronic media and related material that serve instructional functions in educational training." So when teachers talk about getting their students involved with more technology, they need to think outside of the box, in terms of computers, and think about what else they can be doing to satisfy the curriculum?

Time seems to be the biggest need for teachers and preparing for new curricula. In particular, teachers feel that they need time to learn the curriculum which they are to work with, they need time to use the technology in order to fully understand the needs that may arrive as students use the same technologies and then finally they need time to reflect on the choices that they've made. This reflection time should be personal and it should also be done with peers since the sharing of their experiences will affirm that they are satisfying the elements of the curriculum that they are working with and it also lets others see what it is that they are doing in their classrooms. This often leads to growth as other professionals share their ideas coming up with even better projects for the students. As Hampshire (personal communication, January 21, 2002) points out "it is indeed time that makes the difference, and this is always a function of funding".

With the AISI ICT project, one element of design has not lived up to its desired plan and that is follow-up. It was intended that Orbit or experienced schools would go out and lend assistance to those non-experienced schools who were coming on line but it turns out that what is really missing is some follow-up to make sure that where you are is really where you wanted to be.

### Conclusion

The implementation model, which the Foothills School Division's AISI ICT project is using, is a new and successful way in which to implement curricula. I feel that the results of my surveys and interviews prove this conclusively.

Comments regarding the success of ICT and the AISI project reflect on the fact that this is something that teachers are interested in. I relate this to the general growth in Information Technology (IT) in the world around us. Teacher support of the AISI ICT

project is favourable since time is afforded, during the day, for teachers to learn and then quickly apply it to everyday teaching practices in the classroom. The evidence, in the experienced school, of improved student projects, mainly computer generated, shows the growth in the knowledge base of students. As the students have grown, so has their sophistication in using and talking about the computers and related programs. MP3's, platform game consoles, mini-disk, CD-ROM are just some of the terms that we have had to learn but are words that the students have grown up with. "ICT texts tend to have a dual audience of computer programming coded language for machines and verbal language for reading by human beings. Sometimes these come together when the human language matches a command." (Shortis, 2001) It is because of this fact that sometimes teachers feel that they can't compete with their students and so if they are not the teacher, then why teach? The great thing about the AISI ICT project is that it breaks down those barriers where teachers are learning within the walls of their institutions at the same time the students are. Hampshire (personal communication, January 21, 2002) feels that "we are planting the seeds with ICT that will result in some significant pedagogical change. While we may not see it for 5 years or so, we have people thinking about their practice differently and from a more constructivist point of view".

Non-experienced school teachers are also finding a greater awareness and appreciation of the number of skills that students possess through all of the AISI projects, excluding ICT. One moment the student is directing the course of the lesson and then, the next instant, the teacher is leading their students along a path with curricular tie-ins that will allow the student to take the knowledge that they have and apply it to the

outcome. Those students and teachers that are missing pieces of the technological pie can pick up the new skills and apply it to their own background knowledge.

Moore (1989) talks about the Alliance for Better Schools, an idea centred on the 21<sup>st</sup> Century School proposal whereby related institutions commit to improve public education. He also talks about the Holmes Group agenda

which encourages extended preparation programs with more rigorous admission standards, a major in the arts and sciences, a strong clinical component set in the public schools and more meaningful and effective connections with the public schools, including a much more significant role in teacher education for successful practitioners. (Moore, 1989)

It would seem that the model on which AISI is grounded mirrors Holmes Group agenda. As viewed by the teachers, models such as this will work in the 21<sup>st</sup> century in this curriculum and in others. The key seems to be funding, materials to do the job with and time.

It is also interesting to note that 62.5% of all surveyed teachers in the project can only properly define the acronym ICT. 75% of teachers in the experienced school knew what the ICT acronym meant while 50% of teachers in the non-experienced school knew what ICT meant. Integration of AISI throughout curricula is obviously more successful (87.5%) than ICT (62.5%) and it might be just a matter of semantics but this is an area where more public relations is going to have to occur if it is to be accepted by the teachers who are teaching this mandated curriculum. Some teachers have taken ICT related courses through professional development opportunities in the division or they may have worked on ICT committees in their schools. This would account for the

25% disparity between those teachers who know the acronym ICT and those teachers who do not.

### Implications of the Work

The results of this research should be quite useful for the decision makers of the district. They should show which resources are most needed and most useful. The benefit to teachers should include additional evidence regarding more effective and less effective methods of curriculum implementation. The findings of this study should also help promote more effective uses of resources and greater teacher access to new resources.

The Foothills ICT project seeks to ensure that technology is infused into all core subjects and that it is used as a tool to promote understanding. A major focus of the project is a three-year research plan to determine the success and extent of our implementation. This will serve to guide future technology initiatives. Overall, the major benefit will be in fostering teacher professional growth through staff development and collaboration. It is expected that this should lead to student use of technology as a tool for thinking, collaborating and communicating, rather than simply learning how to use computer applications as ends in themselves. (Foothills School Division, 2000)

In an interview in the fall of 2000, Mr. Hampshire felt that the new curriculum implementation model relied much more on site-situated learning, one-on-one mentoring, and collaboration (Hampshire, 2000) throughout the course of the school year. Traditionally, both governmental and educational institutions have relied more on a

humourous gifts might be handed out to departing attendees, as well as paper handouts which would be distributed during and at the end of the short session. The teachers would be sent excitedly on their way, eager to use them the next day, or the next week, only to find that they had forgotten some steps, or forgotten altogether what they were supposed to have learned. The time, effort, and cost that went into this method of in-service were probably wasted.

The vast majority of teachers and all administrators welcome the opportunity to learn about and implement ICT in the manner we have designed. We have adopted a self-referral approach to working with staff whereby teachers are left to decide if, when and how they wish to work to work with an ICT team member. Virtually all staff have taken advantage of this and approached ICT team members with questions, ideas, projects, units etc. There are a few who to date have exhibited little interest in ICT, however this is a common occurrence with any sort of curriculum implementation. (Hampshire, 2000)

The results of this study will help determine if such optimism is warranted. As well, they will show the extent to which new teaching methods are accompanying the implementation of the ICT program.

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## Appendix A

### Survey Questions

Place an "x" in the box  beside the response which is the correct or best answer.

1) What division / level do you primarily work at?

- Division I
- Division II

2) Have you ever worked with another curriculum implementation team during your career as a teacher?

- Yes
- No

3) As of September 1, 2000, how would you rate your technology skills?

- Poor
- Weak
- Average
- Very good
- Excellent

4) As of September 1, 2001, how would you rate your technology skills?

- Poor
- Weak
- Average
- Very good
- Excellent

5) How would you describe the level of technical expertise of your students, on average?

- Poor
- Weak
- Average
- Very good
- Excellent

- 6) To what extent do you understand what ICT (Information and Communication Technology) is about?
- Very Little
  - Moderately Well
  - A lot
- 7) How would you describe the level of curricular support for implementing ICT in the district? (E.g. textbooks, handouts, curriculum guides)
- Very limited support
  - Adequate support
  - Lots of support
- 8) How would you describe the level of curricular support for implementing ICT in your school? (E.g. textbooks, handouts, curriculum guides)
- Very limited support
  - Adequate support
  - Lots of support
- 9) How would you describe the level technical support for implementing ICT in the district? (E.g. workshops, special guest presentations, staff or divisional personnel on hand to help with problems)
- Very limited support
  - Adequate support
  - Lots of support
- 10) How would you describe the method by which your school is implementing the ICT curriculum as compared with the implementation of other curricula? (Check as many as appropriate)
- Unique
  - Effective
  - Ineffective
  - Confusing
  - Comparable
  - Other

## Appendix B

### Interview Questions

The following questions which I propose to ask in my interview with staff members of the school which has been chosen to be studied for this project.

- 1) For the record, what is your current job title?
  
- 2) a) What is your teaching background?  
b) What is your administrative background?  
c) Other?
  
- 3) I understand that you are working on the AISI funded ICT project in the Foothills School Division.
  - a) What is AISI?
  
  - b) What is ICT?
  
- 4) What is your role as part of this project?
  
- 5) What are some of the benefits of a project such as this?
  
- 6) What are some of the shortcomings of a project such as this?
  
- 7) What evidence of student learning have you seen resulting from this project?
  
- 8) What tools or measures are used to determine the success of this project?
  
- 9) In your experience, is this type of curriculum implementation new or something that has been done by governments and educators in the past?

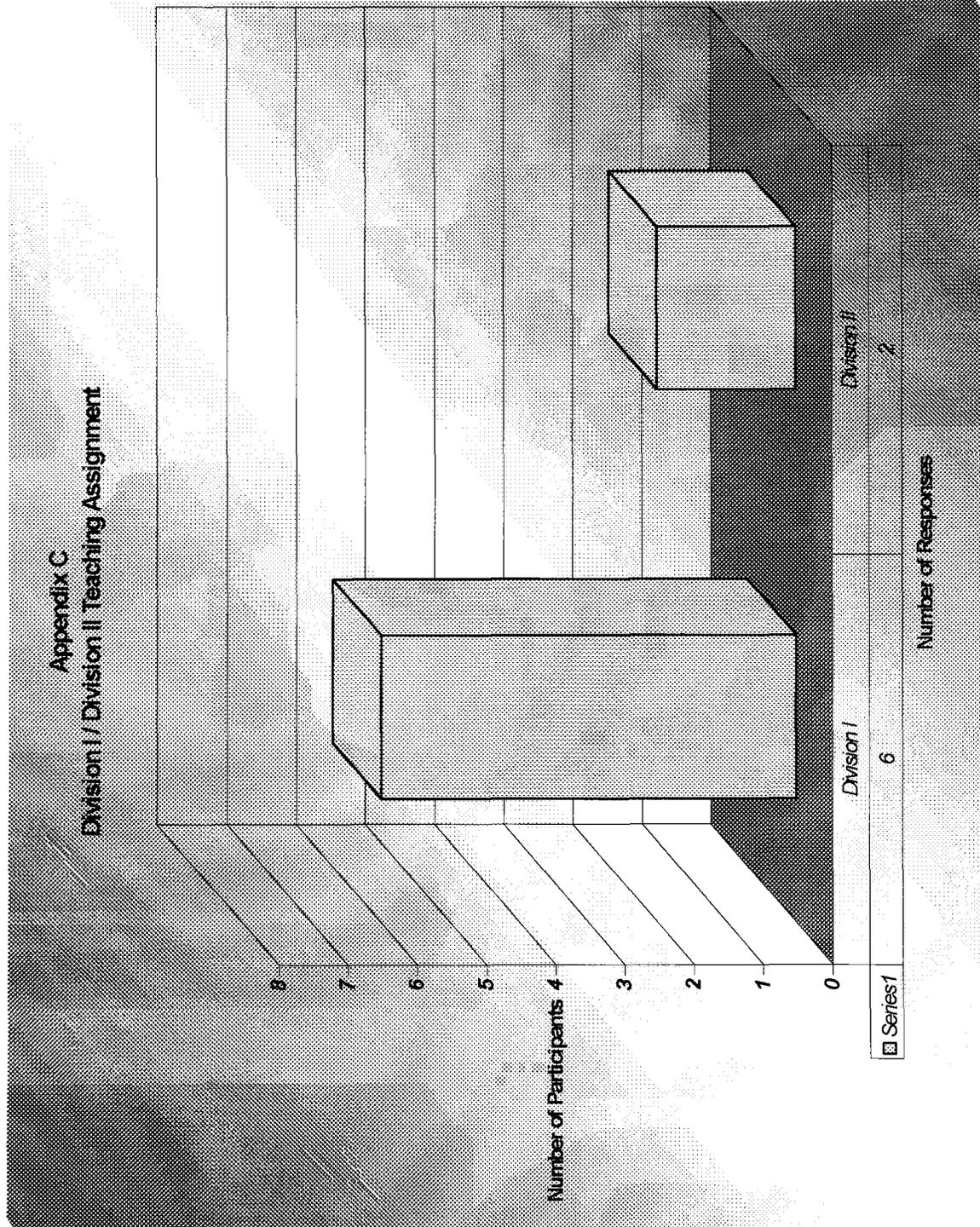
*Choose question 11 or 12 to answer. Obviously you would not have an answer for both.*

- 10) When this type of project has been attempted in the past, do you feel it has been a successful way to implement new curricula? Please explain.

- 11) If this type of project is new to you, do you feel that is it going to be a successful way to implement new curricula? Please explain.
  
- 12) Do you find that the staffs with which you work are accepting of you and your role in AISI? What evidence do you have, for or against?
  
- 13) Are there some things staff members can do to make better use of you and your resources?
  
- 14) Do you see ICT as a way to mandate provincial testing in technological areas? Please explain.

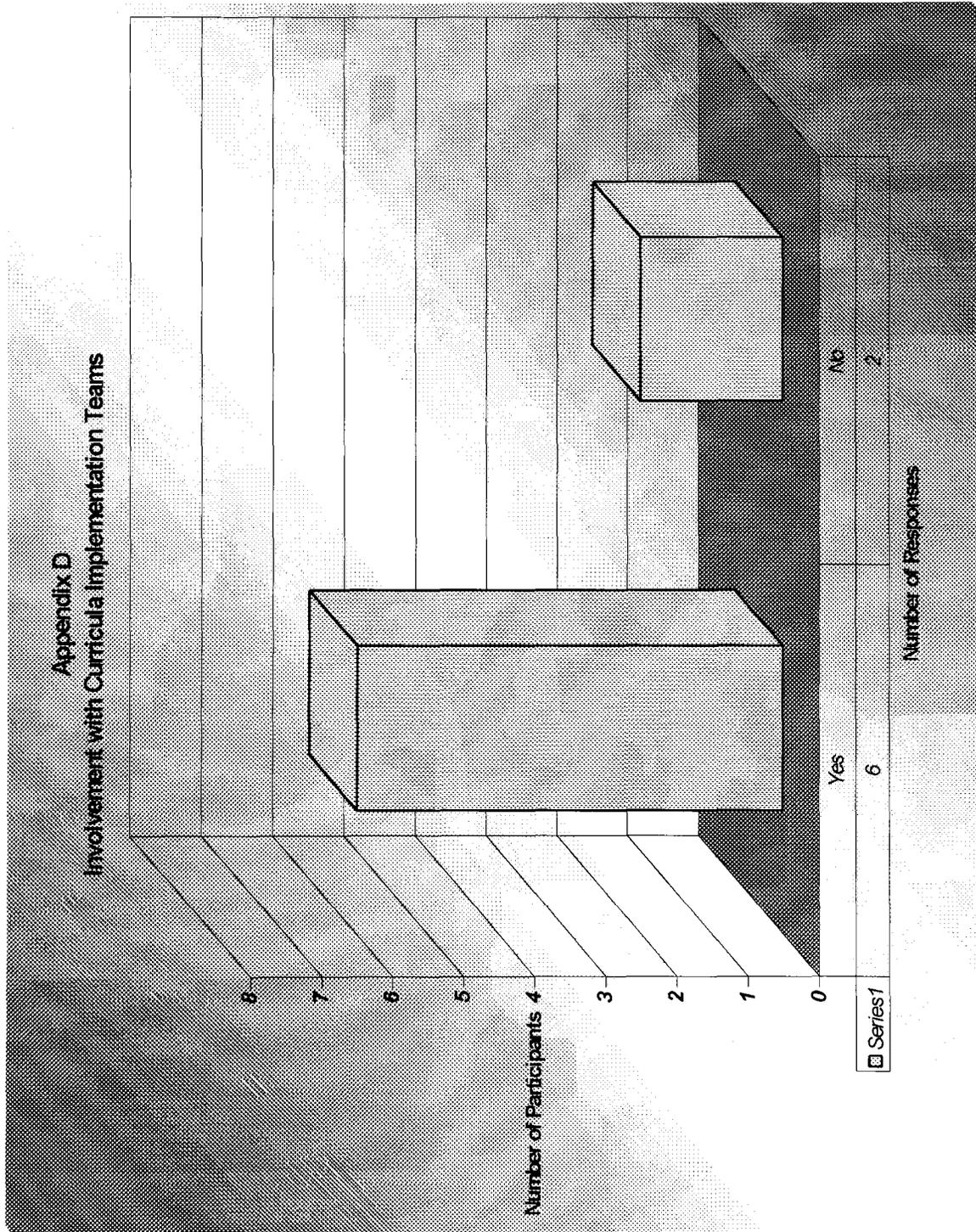
Appendix C

Division I / Division II Teaching Assignment



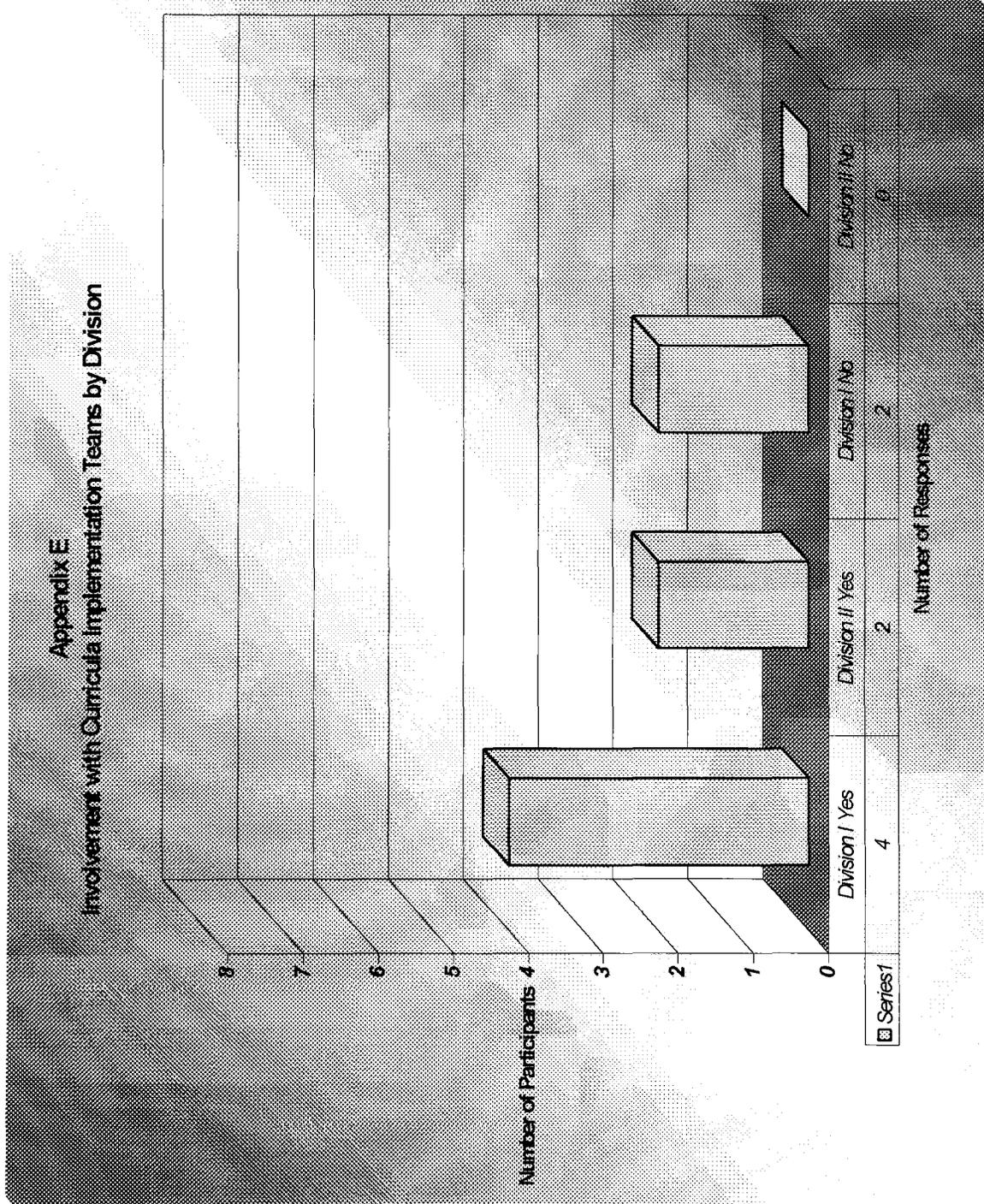
# Appendix D

## Involvement with Curricula Implementation Teams



Appendix E

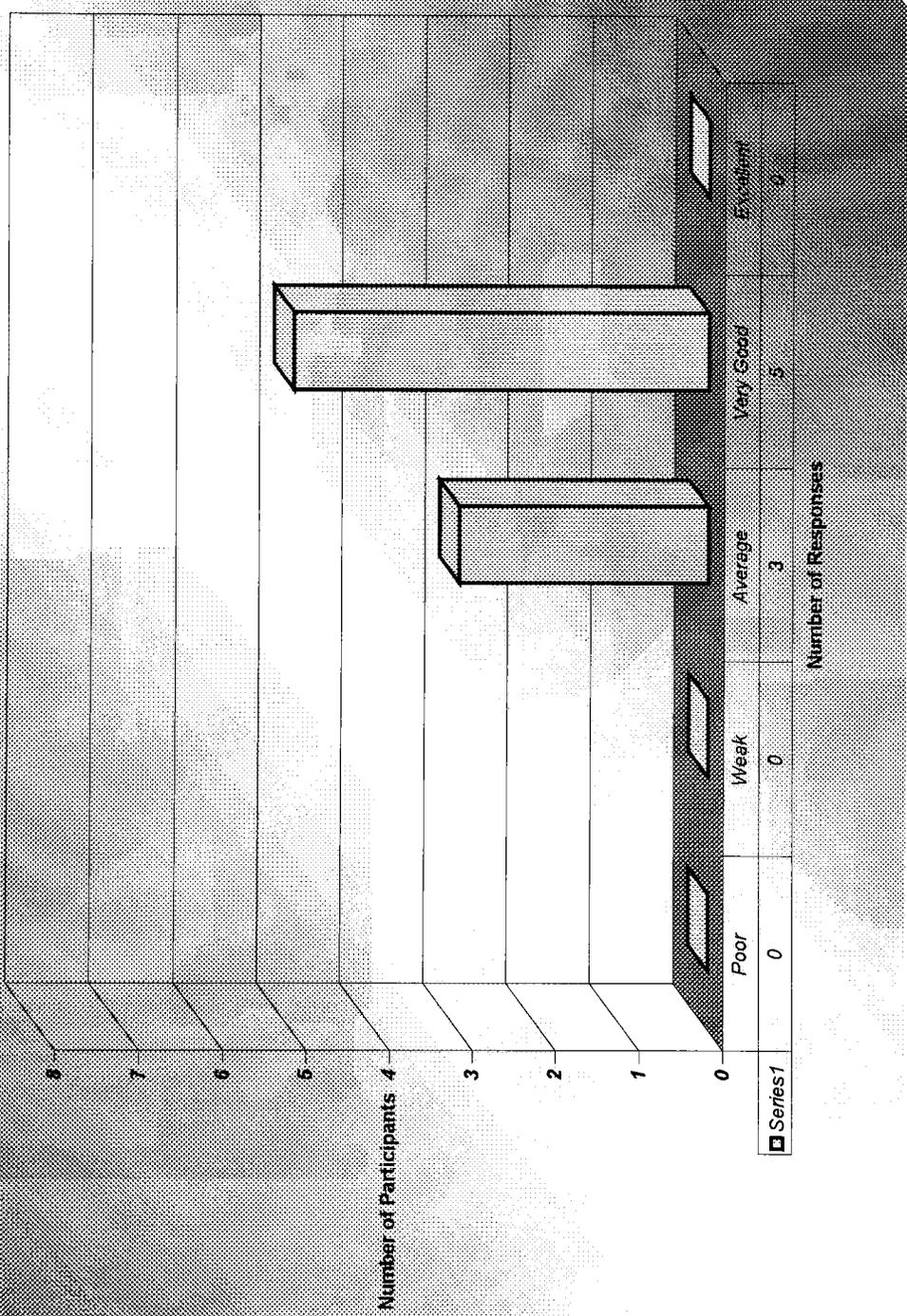
Involvement with Curricula Implementation Teams by Division



Appendix F

Personal Technology Skills Rating – September 2000

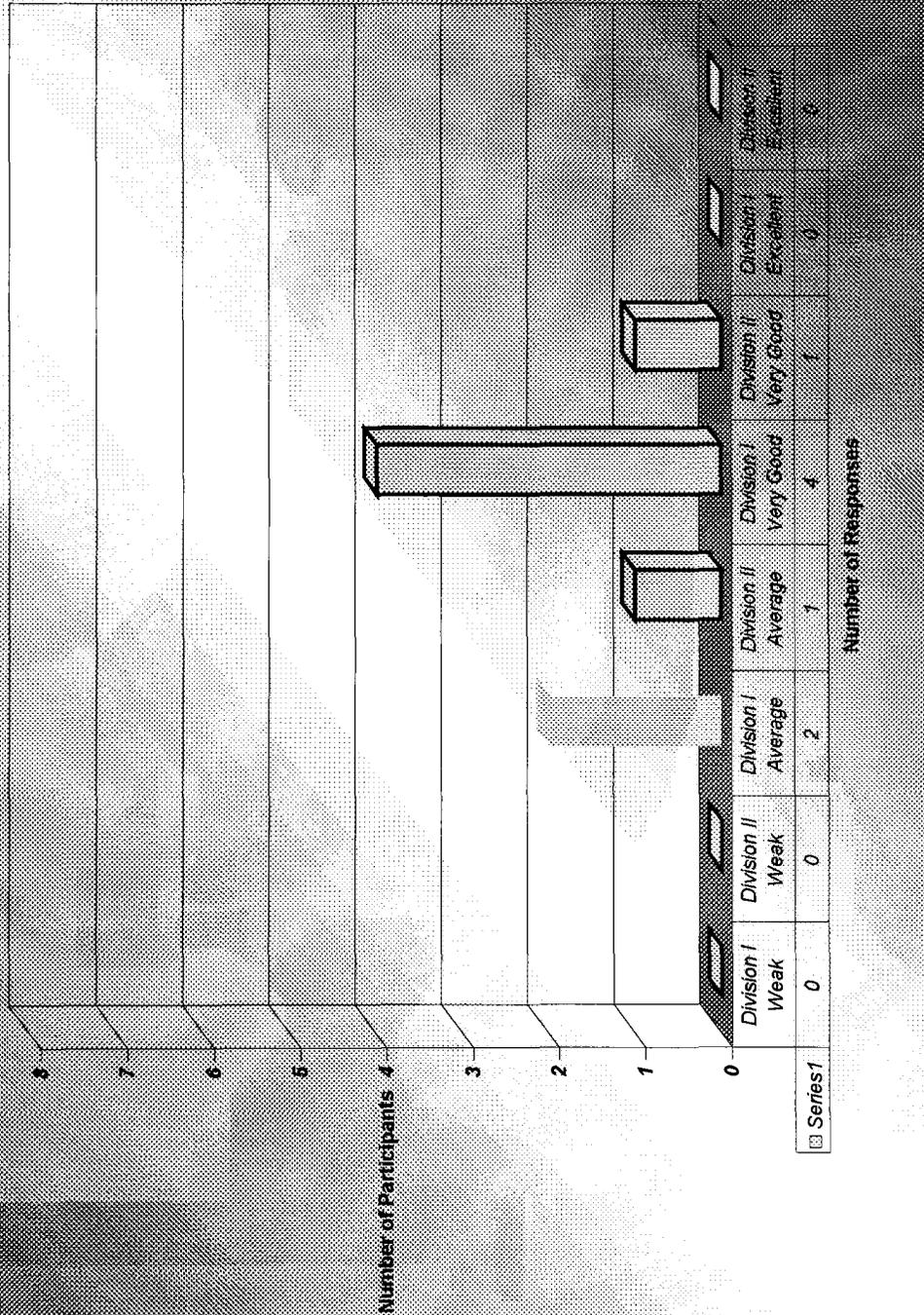
Appendix F  
Personal Technology Skills Rating - September 2000



# Appendix G

## Personal Technology Skills Rating by Division – September 2000

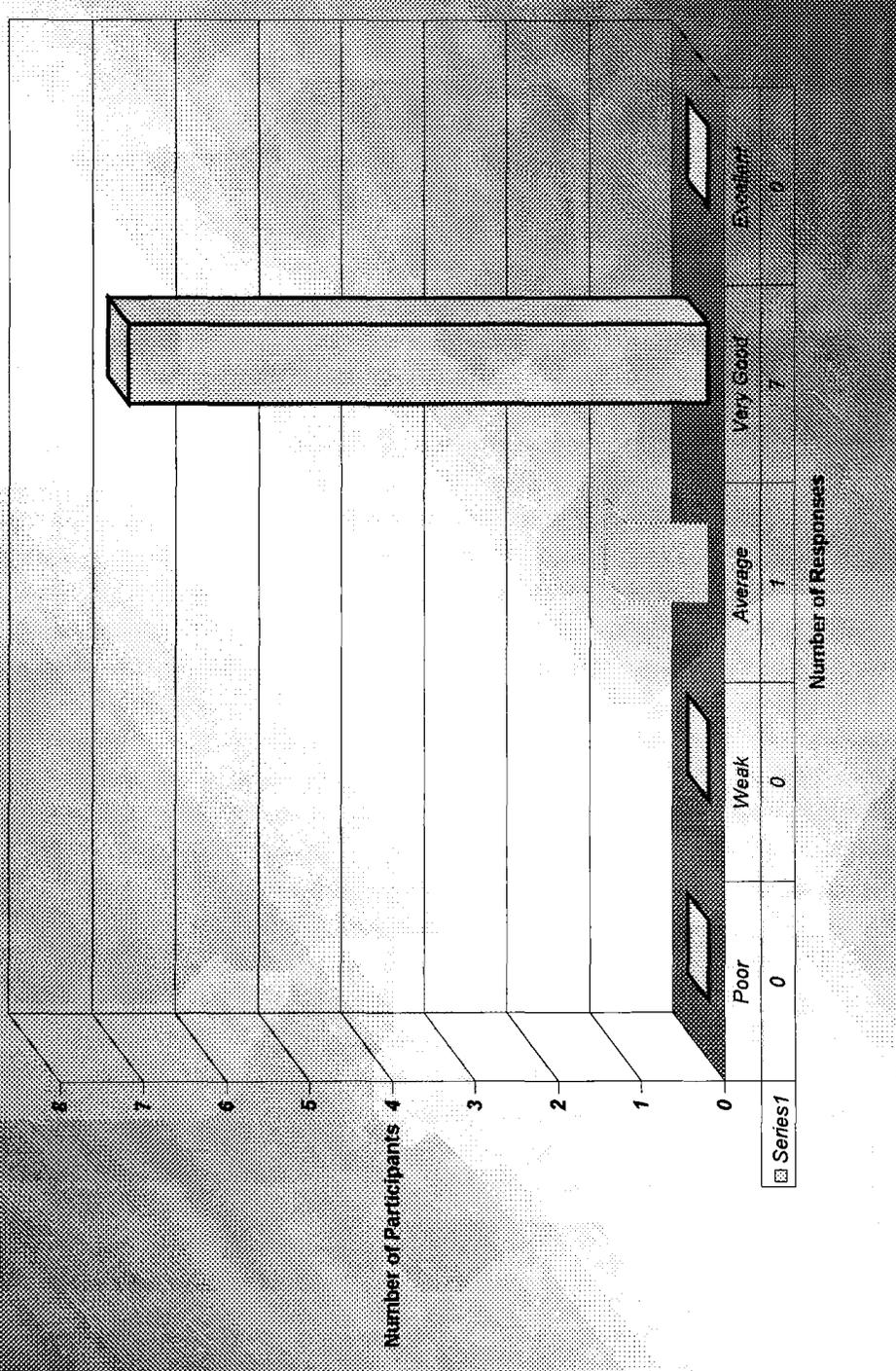
Appendix G  
Personal Technology Skills Rating by Division - September 2000



# Appendix H

## Personal Technology Skills Rating – September 2001

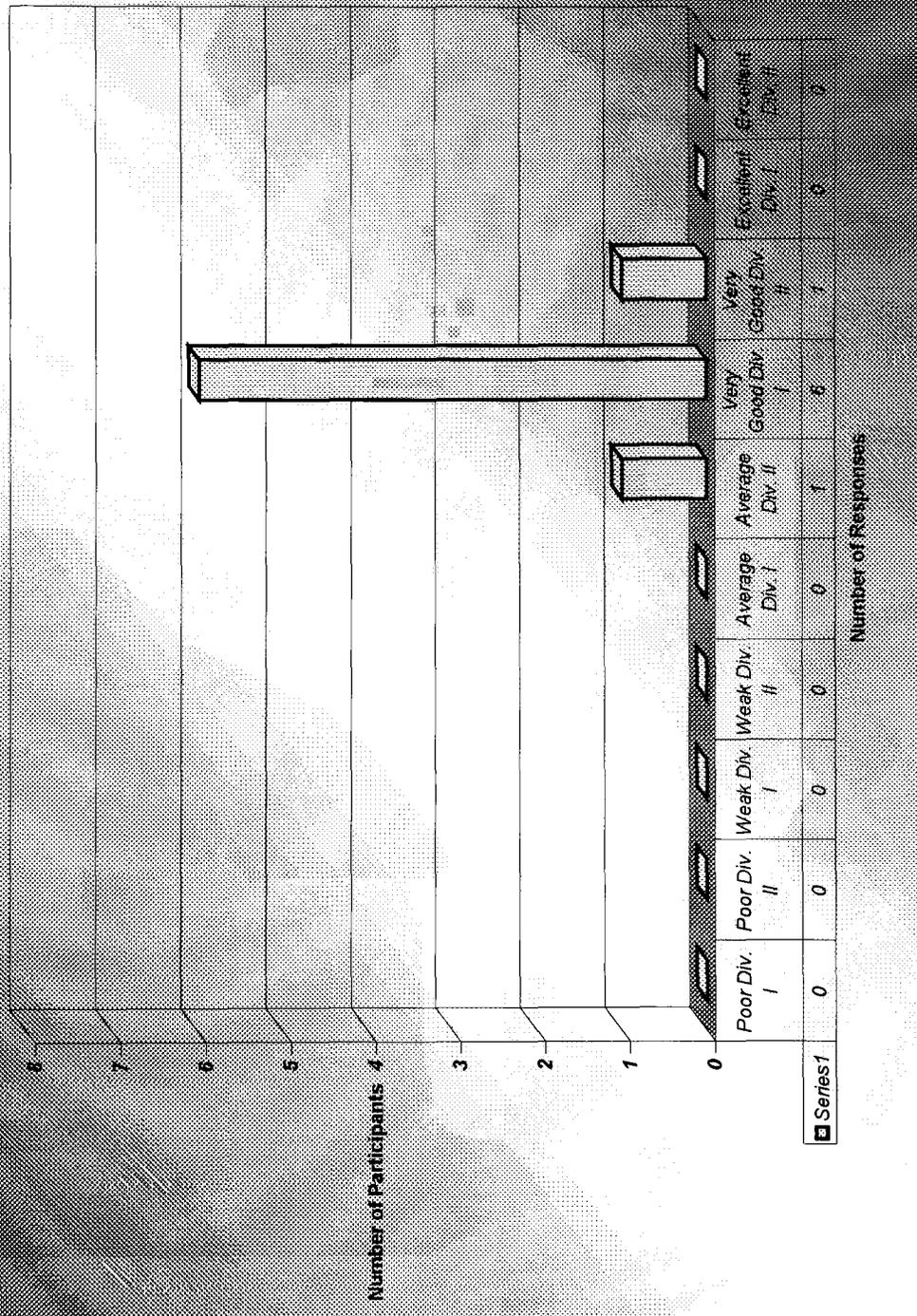
Appendix H  
Personal Technology Skills Rating - September 2001



# Appendix I

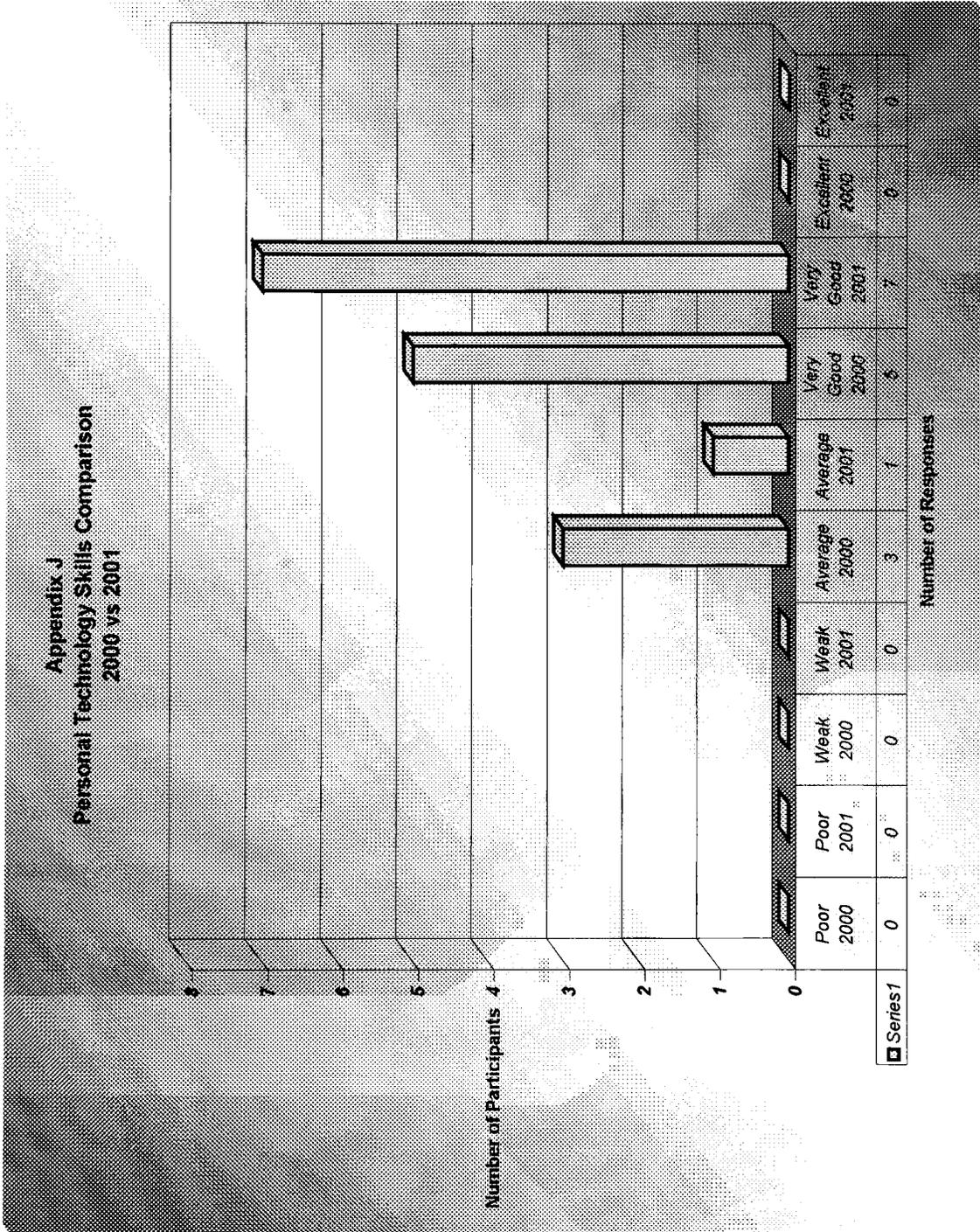
## Personal Technology Skills Rating by Division

Appendix I  
Personal Technology Skills Rating by Division



Appendix J

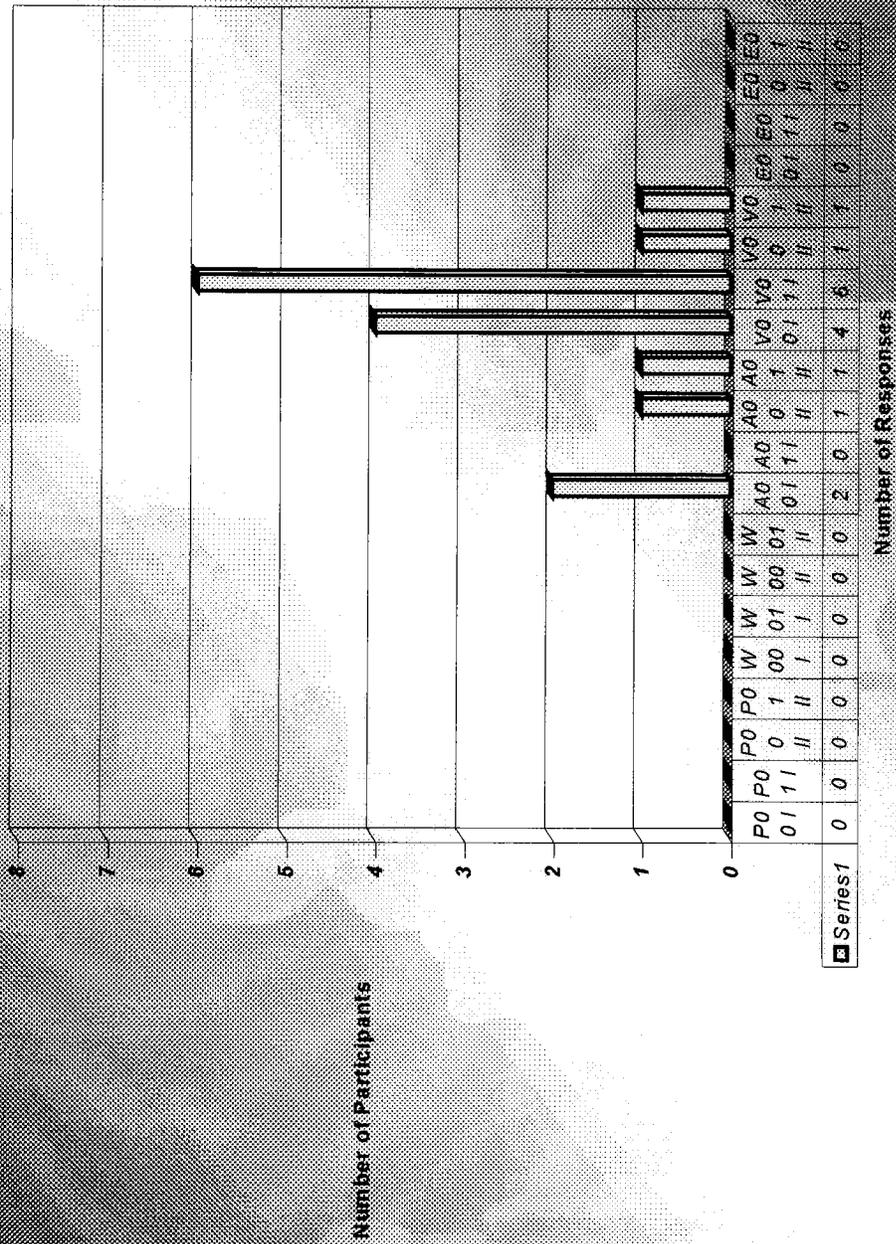
Personal Technology Skills Comparison – 2000 vs. 2001



# Appendix K

## Personal Technology Skills Comparison by Division / Year

Table 4.3  
Personal Technology Skills Comparison by Division / Year



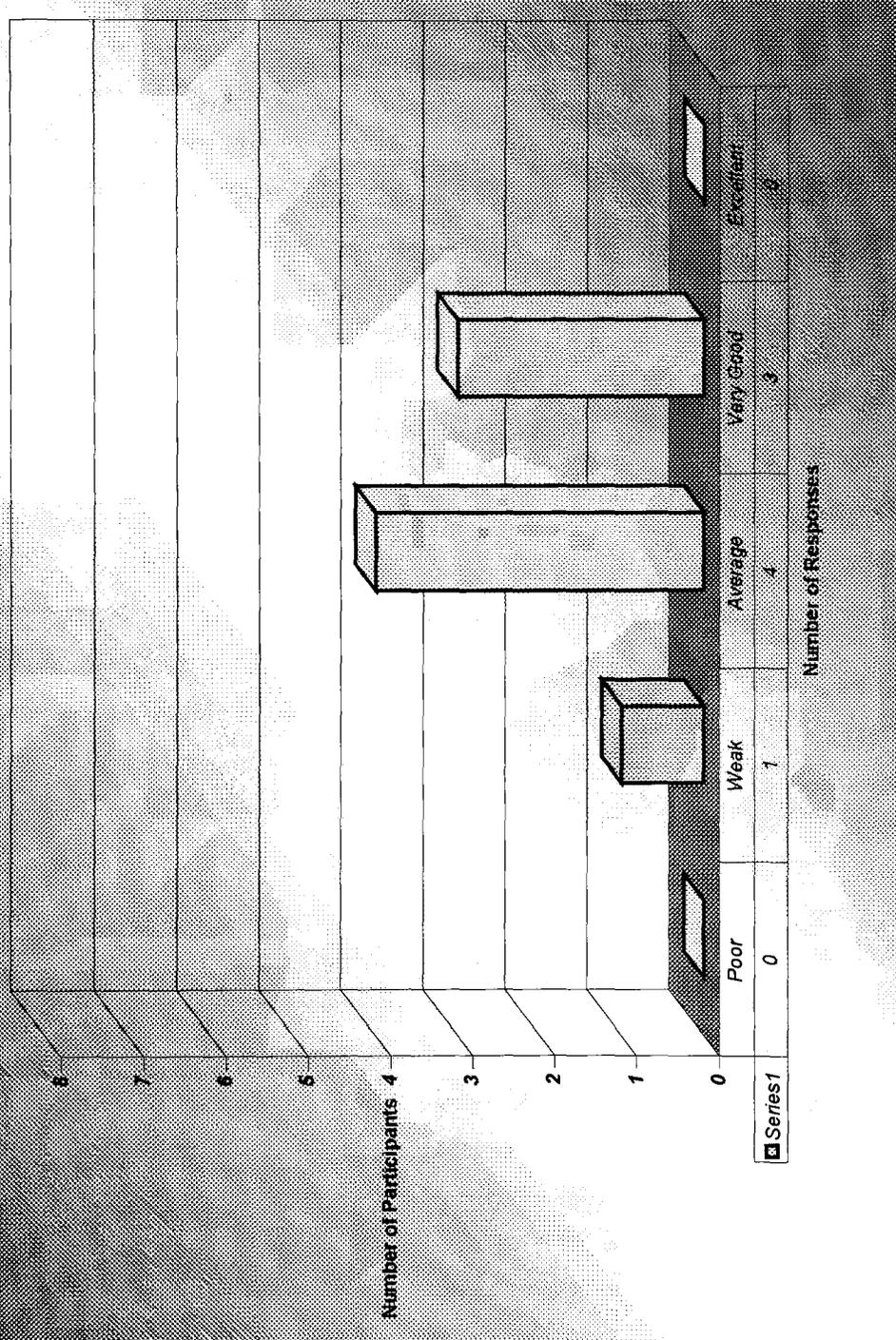
**Table 1****Legend for Appendix K**

|        |           |      |             |
|--------|-----------|------|-------------|
| P00 I  | POOR      | 2000 | DIVISION I  |
| P01 I  | POOR      | 2001 | DIVISION I  |
| P00 II | POOR      | 2000 | DIVISION II |
| P01 II | POOR      | 2001 | DIVISION II |
|        |           |      |             |
| W00 I  | WEAK      | 2000 | DIVISION I  |
| W01 I  | WEAK      | 2001 | DIVISION I  |
| W00 II | WEAK      | 2000 | DIVISION II |
| W01 II | WEAK      | 2001 | DIVISION II |
|        |           |      |             |
| A00 I  | AVERAGE   | 2000 | DIVISION I  |
| A01 I  | AVERAGE   | 2001 | DIVISION I  |
| A00 II | AVERAGE   | 2000 | DIVISION II |
| A01 II | AVERAGE   | 2001 | DIVISION II |
|        |           |      |             |
| V00 I  | VERY GOOD | 2000 | DIVISION I  |
| V01 I  | VERY GOOD | 2001 | DIVISION I  |
| V00 II | VERY GOOD | 2000 | DIVISION II |
| V01 II | VERY GOOD | 2001 | DIVISION II |
|        |           |      |             |
| E00 I  | EXCELLENT | 2000 | DIVISION I  |
| E01 I  | EXCELLENT | 2001 | DIVISION I  |
| E00 II | EXCELLENT | 2000 | DIVISION II |
| E01 II | EXCELLENT | 2001 | DIVISION II |

Appendix L

Teacher's Opinion of Student's Technical Expertise

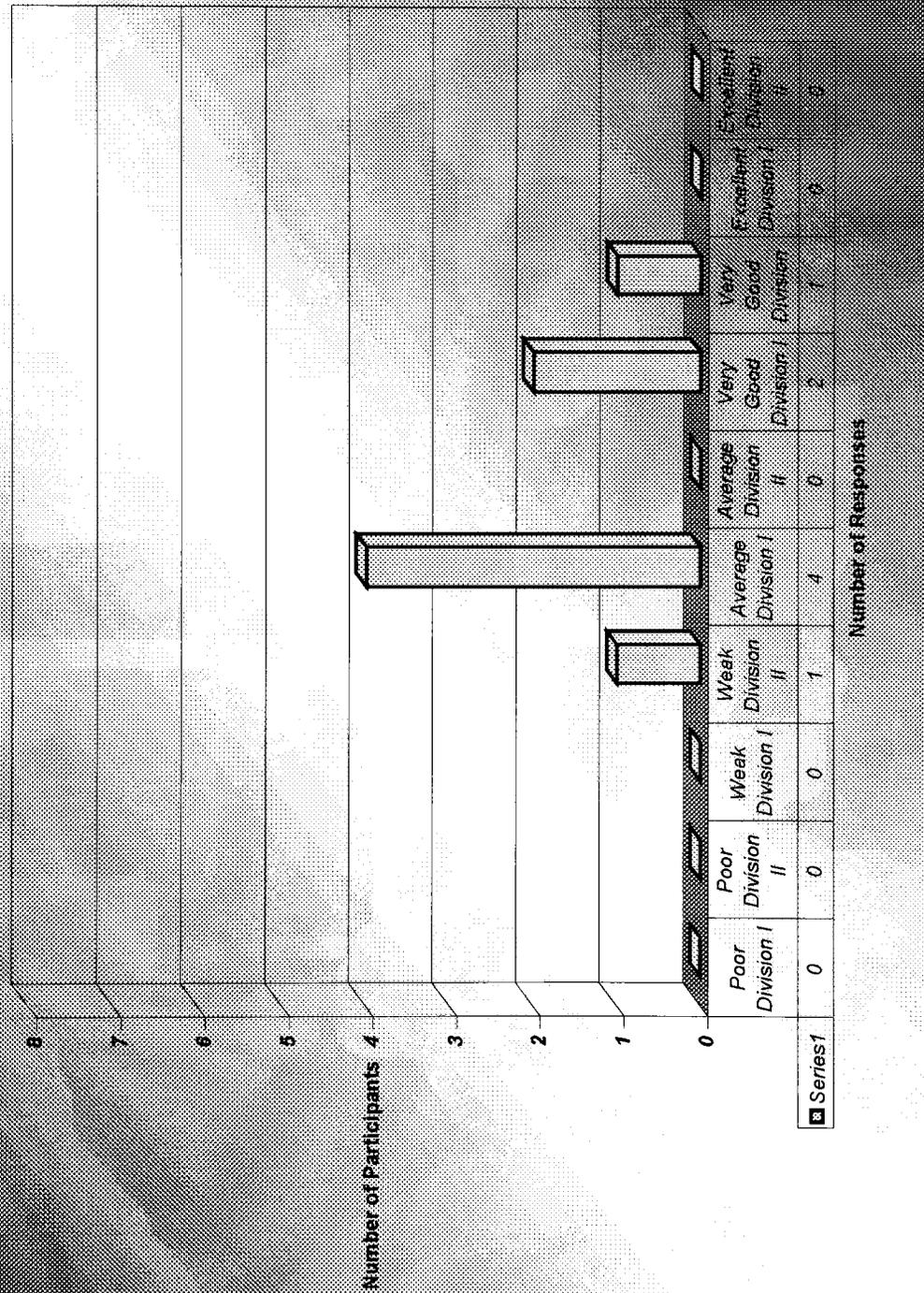
Table 5  
Teacher's Opinion of Student's Technical Expertise



# Appendix M

## Teacher's Opinion of Student's Technical Expertise by Division

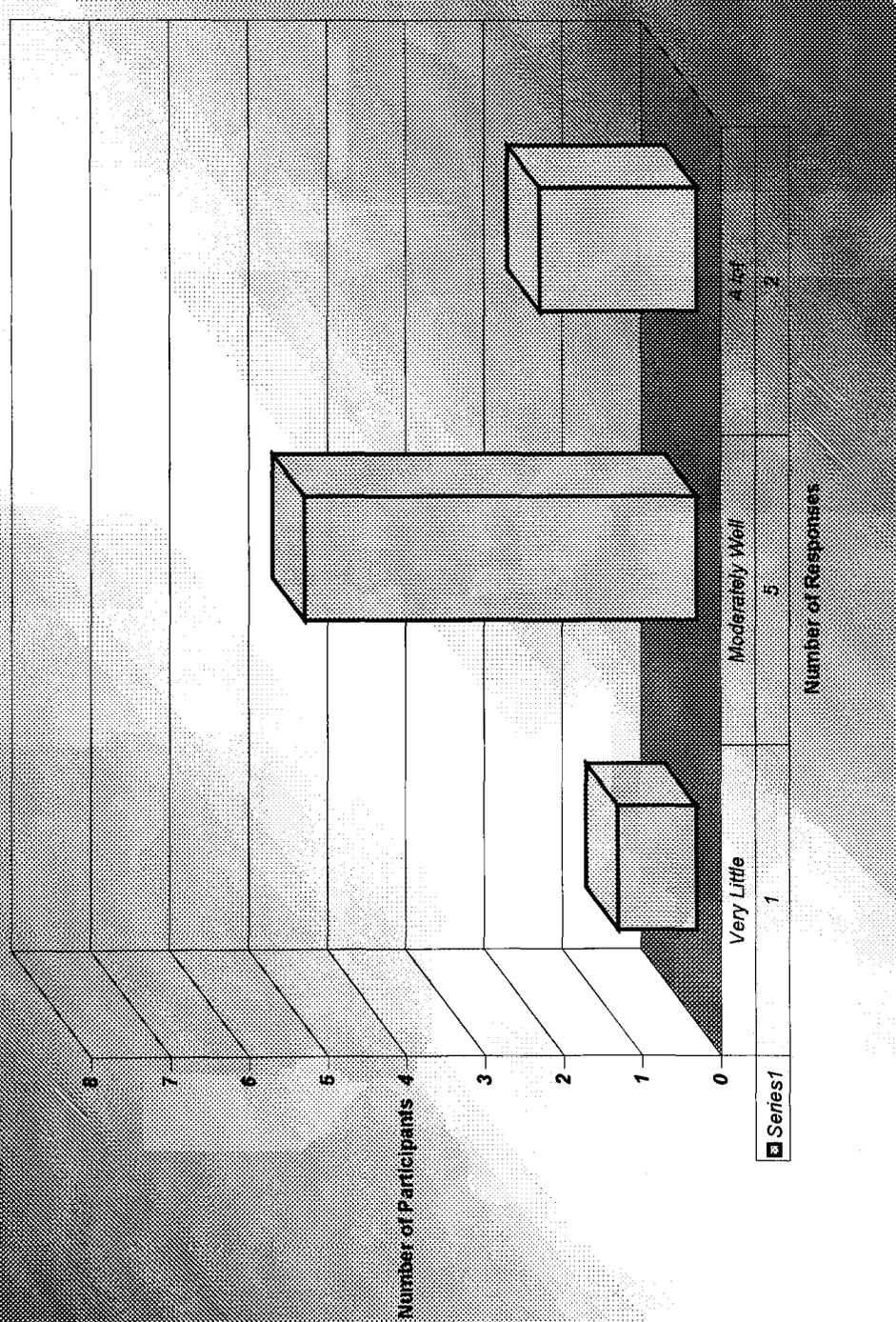
Table 5.1  
Teacher's Opinion of Student's Technical Expertise by Division



Appendix N

Teacher's Understanding of Information and Communication Technology

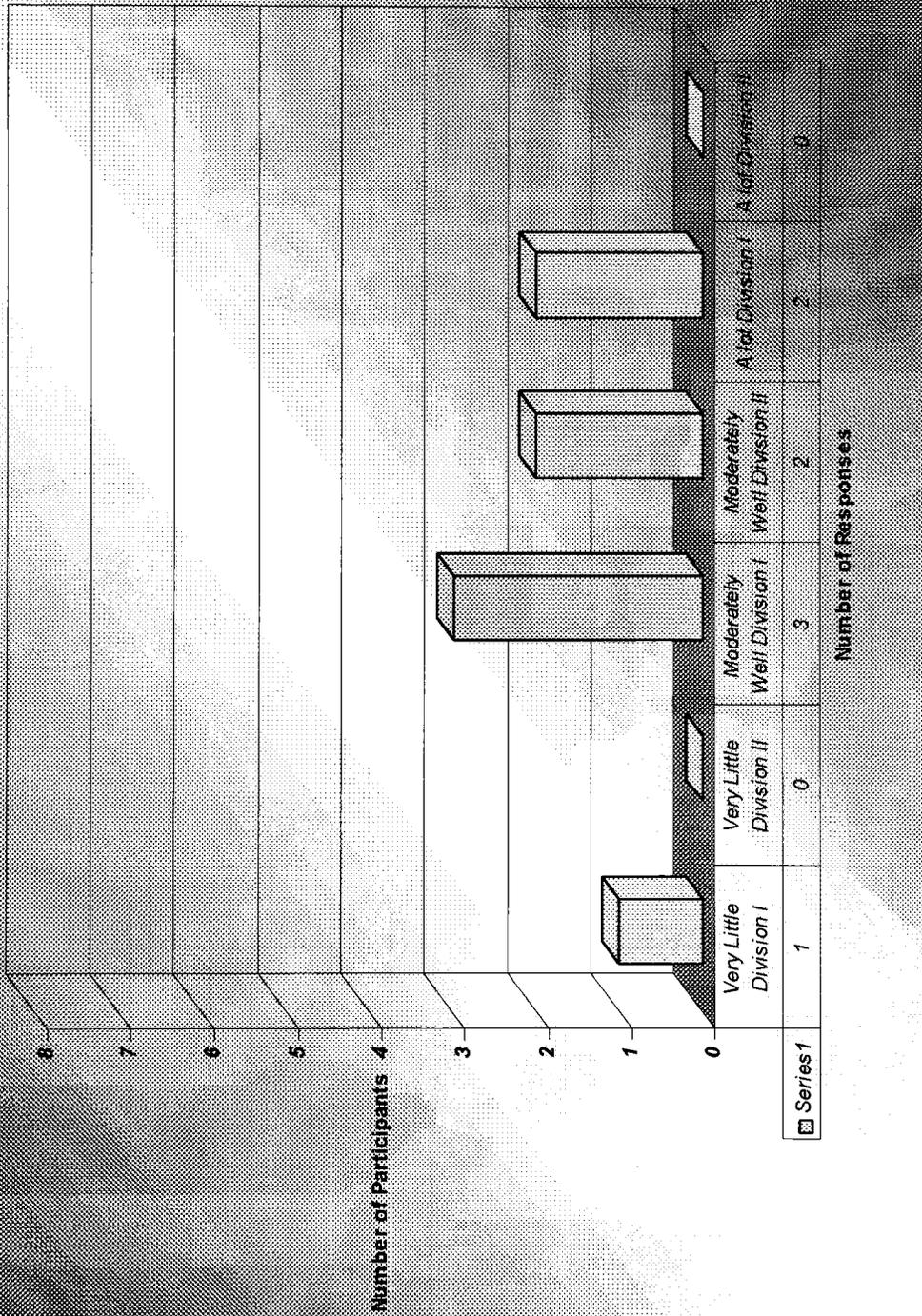
Table 6  
Teacher's Understanding of Information and Communication Technology



Appendix O

Teacher's Understanding of Information and Communication Technology by Division

Table 6.1  
Teacher's Understanding of Information and Communication Technology by Division

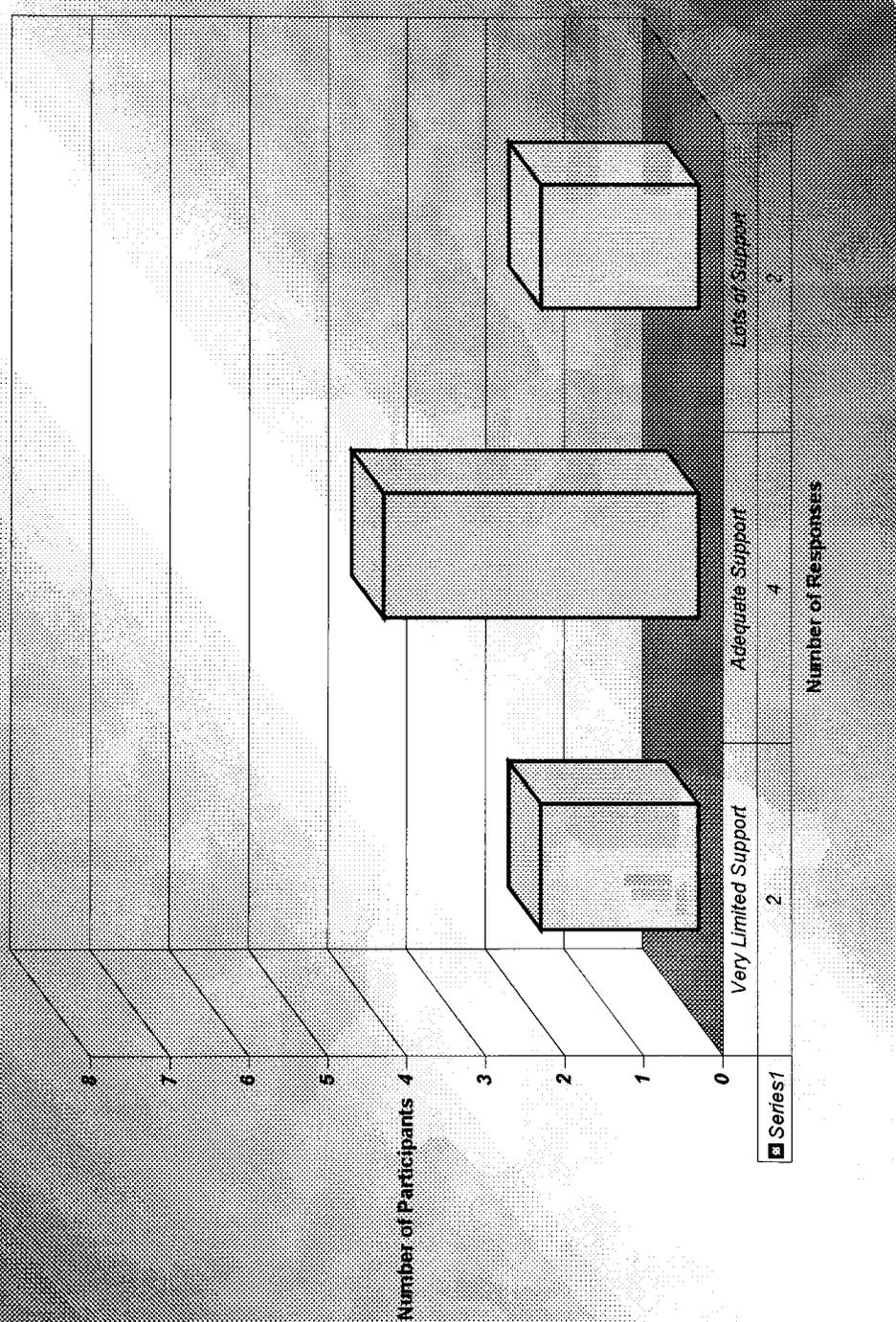


Appendix P

Divisional Support for Implementation of Information and Communication

Technology Curriculum

Table 7  
Divisional Support for Implementation of Information and Communication Technology Curriculum

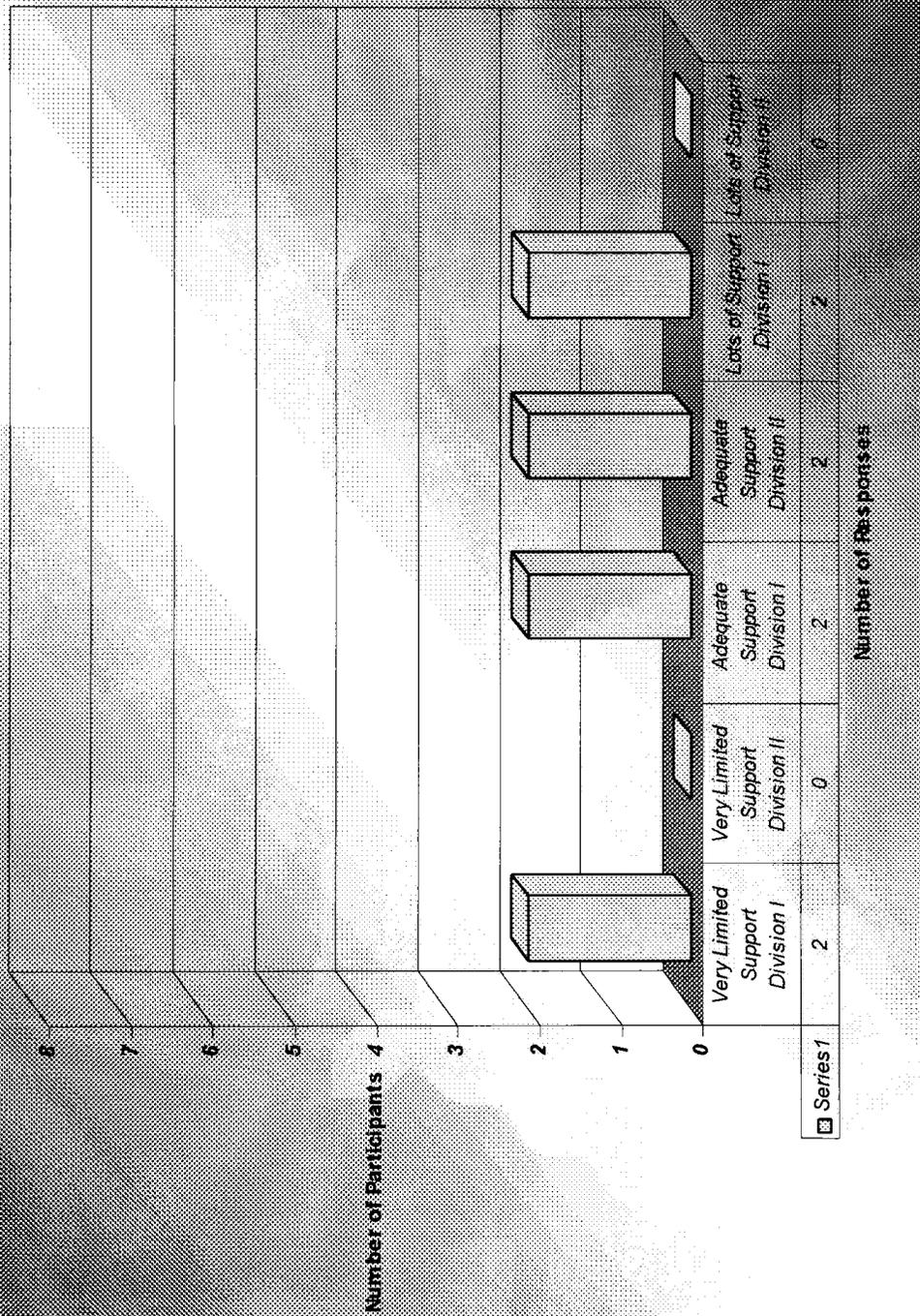


## Appendix Q

### Divisional Support for Implementation of Information and Communication

#### Technology Curriculum by Division

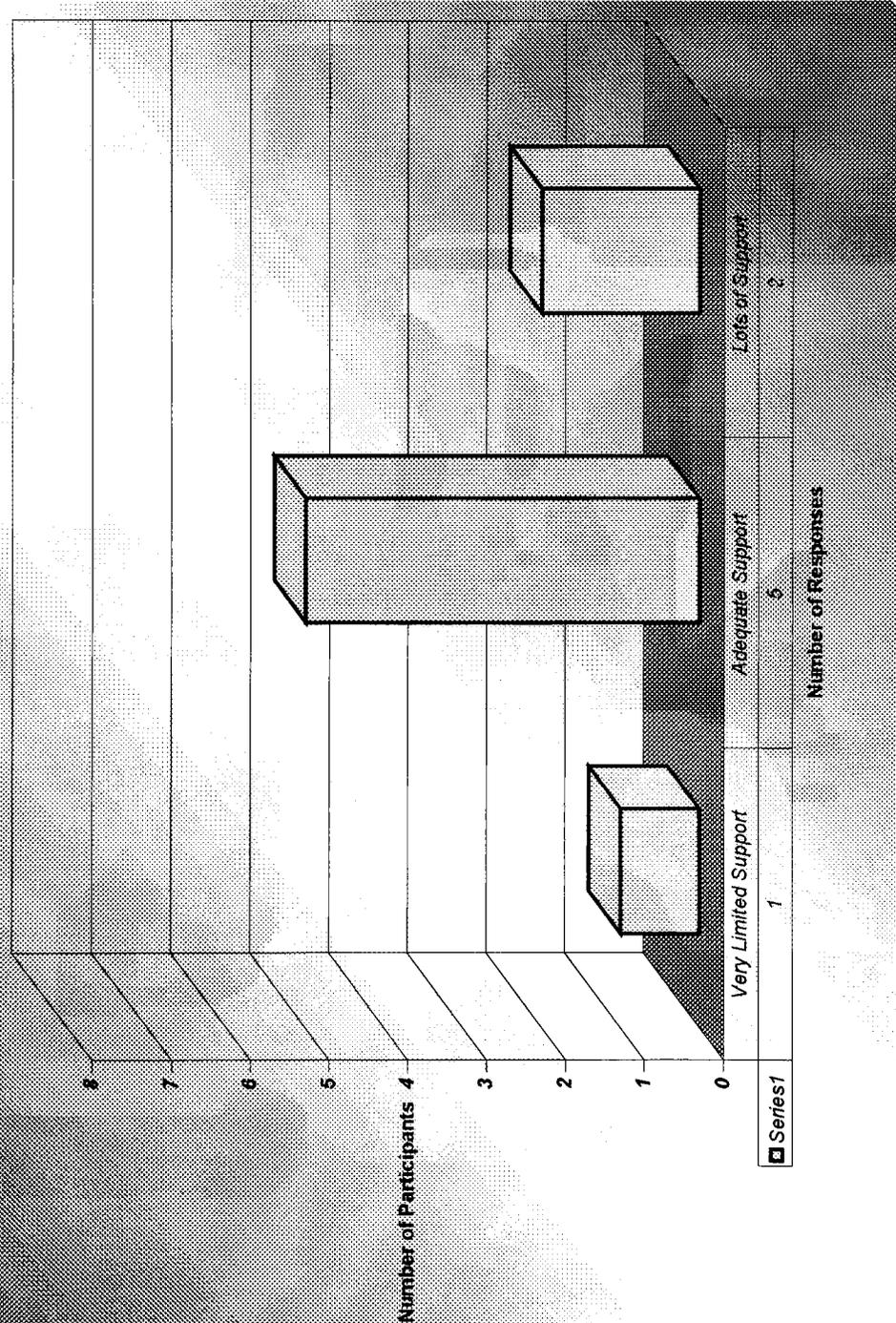
**Table 7.1**  
**Divisional Support for Implementation of Information and Communication Technology Curriculum by Division**



Appendix R

School Support for Implementing the Information and Communication  
Technology Curriculum

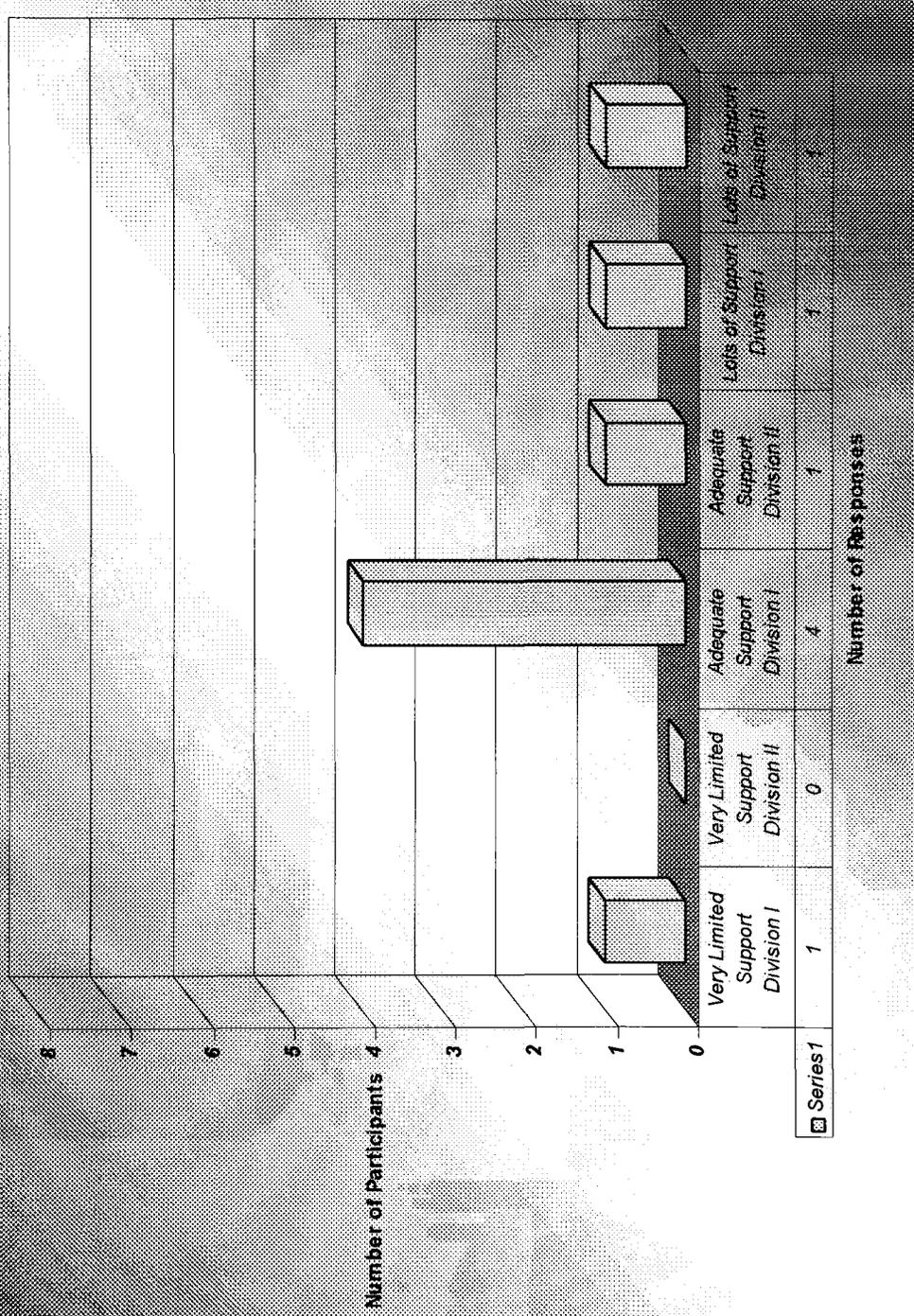
Table 8  
School Support for Implementing the Information and Communication Technology Curriculum



Appendix S

School Support for Implementing the Information and Communication  
Technology Curriculum by Division

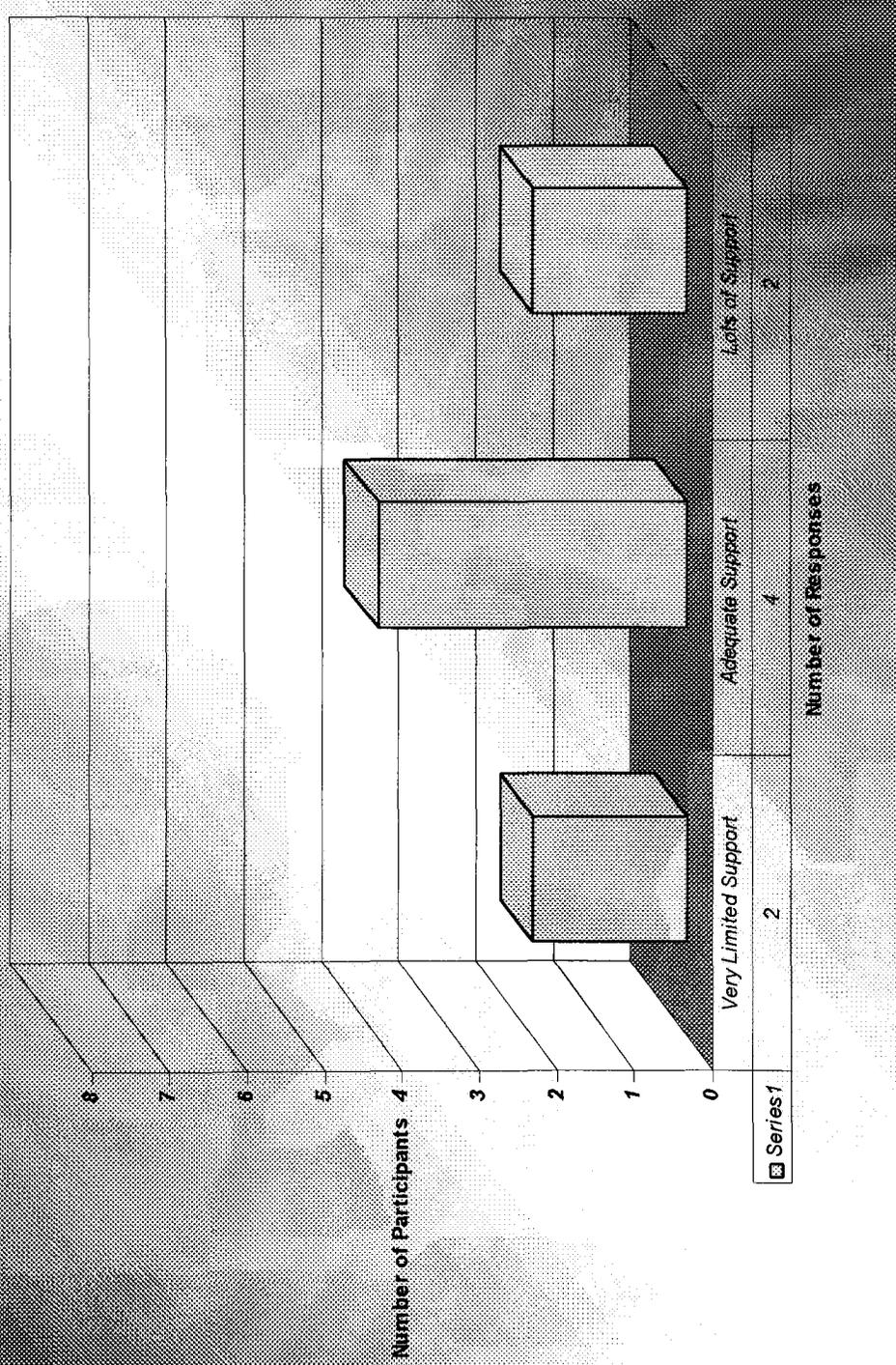
Table 8.1  
School Support for Implementing the Information and Communication Technology Curriculum by Division



Appendix T

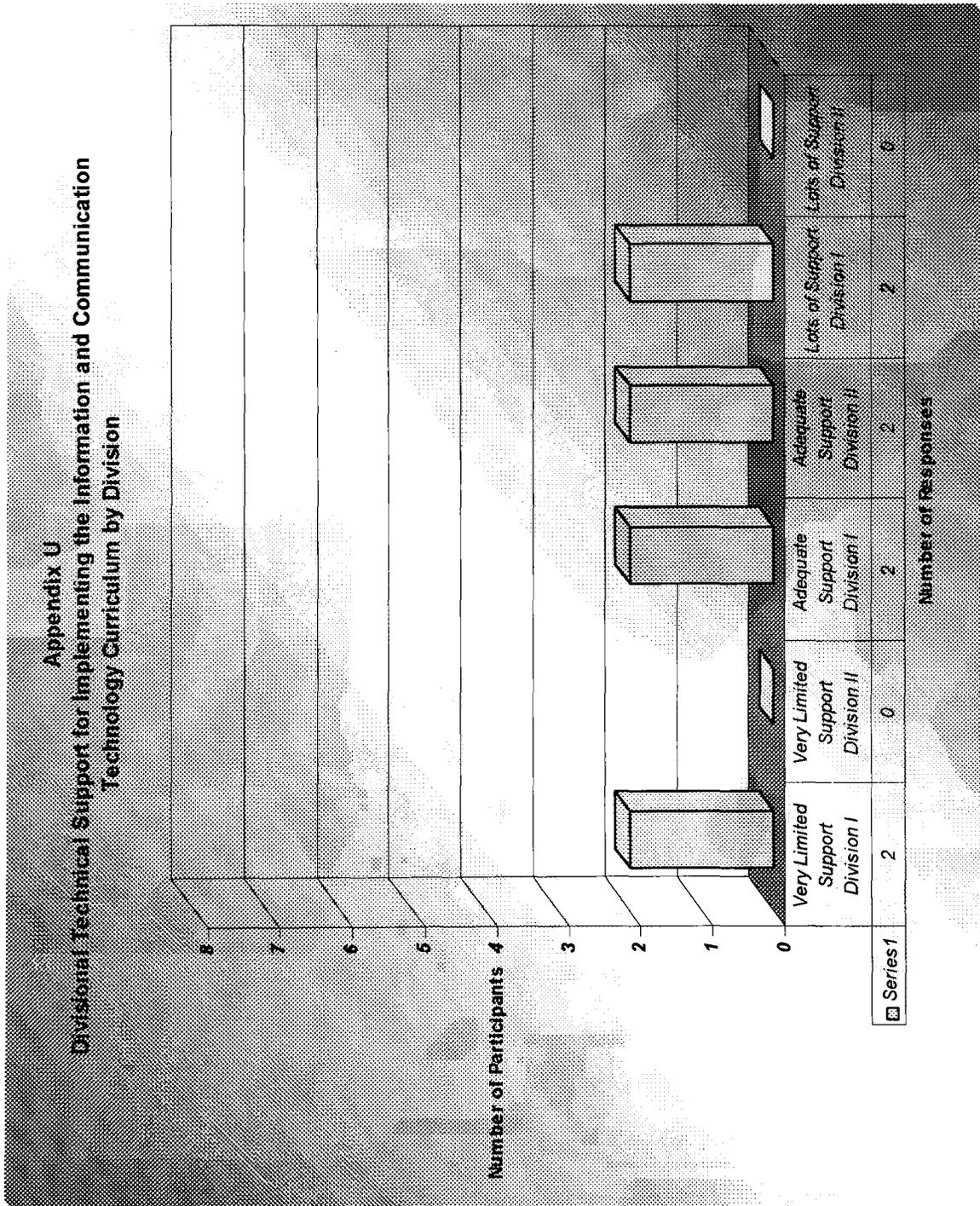
Divisional Technical Support for Implementing the Information and Communication Technology Curriculum

Table 9  
Divisional Technical Support for Implementing the Information and Communication Technology Curriculum



## Appendix U

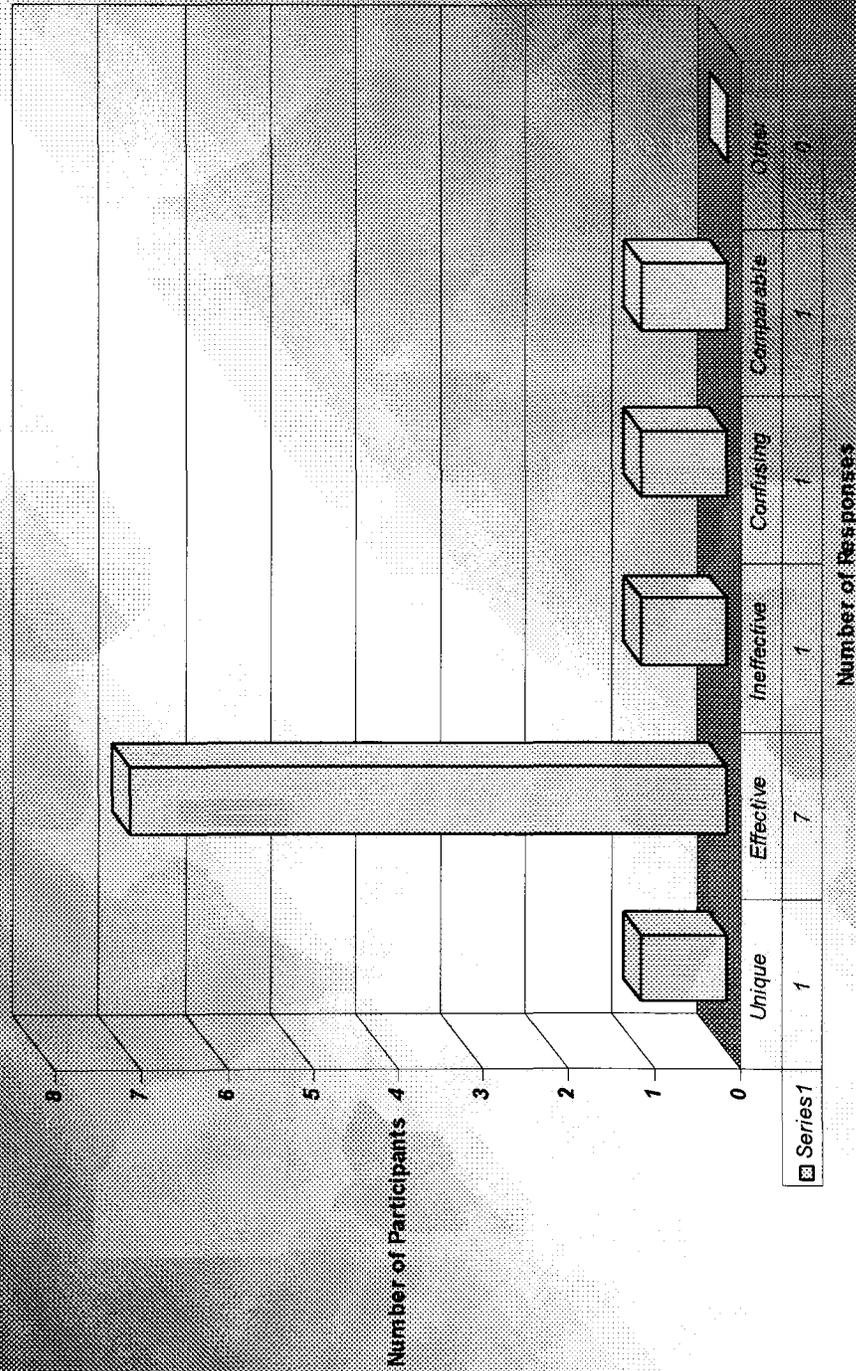
### Divisional Technical Support for Implementing the Information and Communication Technology Curriculum by Division



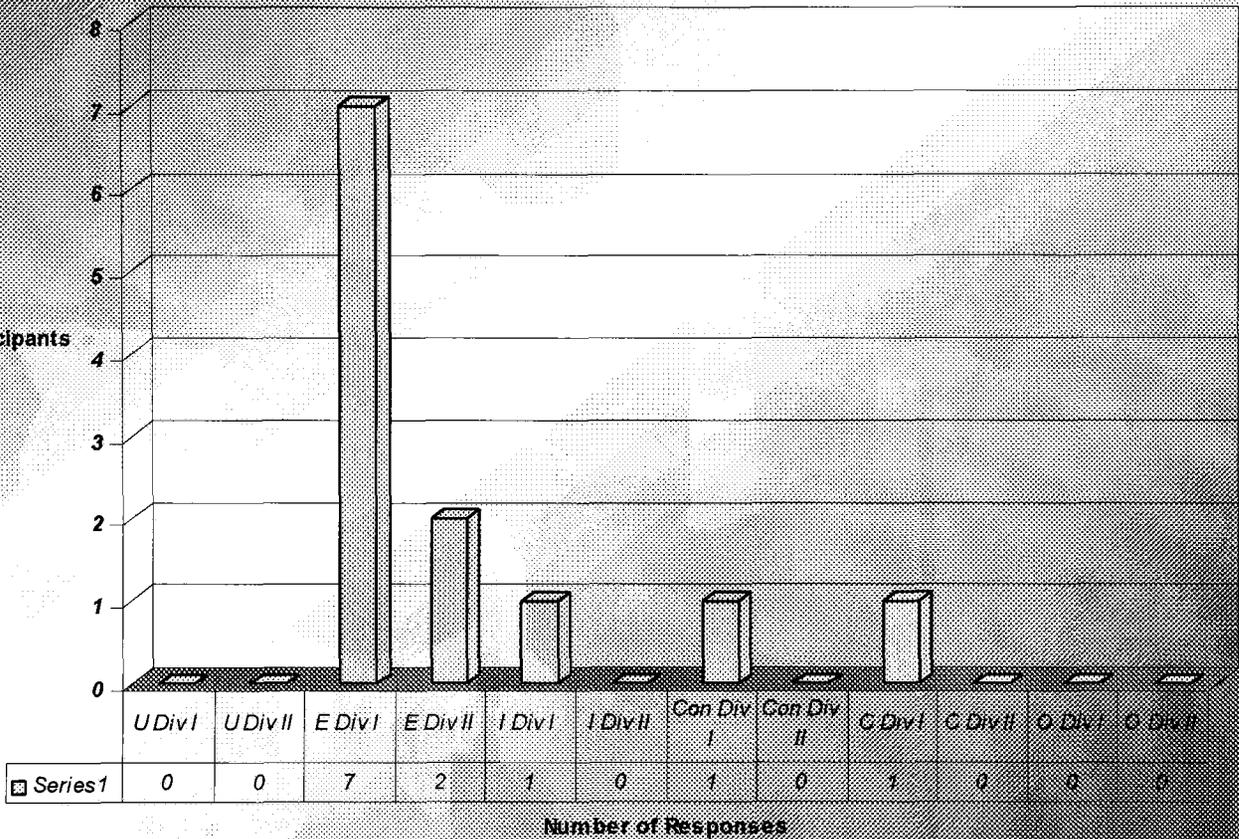
# Appendix V

## Information and Communication Technology Curriculum Implementation Method vs. Other Curricula

Appendix V  
Information and Communication Technology Curriculum Implementation Method  
vs Other Curricula



**Appendix W**  
**Information and Communication Technology Curriculum Implementation Method**  
**vs Other Curricula by Division**  
 (Note: More than one choice could have been selected)



**Table 2**  
**Legend for Appendix W**

|            |             |             |
|------------|-------------|-------------|
| U DIV I    | UNIQUE      | DIVISION I  |
| U DIV II   | UNIQUE      | DIVISION II |
|            |             |             |
| E DIV I    | EFFECTIVE   | DIVISION I  |
| E DIV II   | EFFECTIVE   | DIVISION II |
|            |             |             |
| I DIV I    | INEFFECTIVE | DIVISION I  |
| I DIV II   | INEFFECTIVE | DIVISION II |
|            |             |             |
| CON DIV I  | CONFUSING   | DIVISION I  |
| CON DIV II | CONFUSING   | DIVISION II |
|            |             |             |
| C DIV I    | COMPARABLE  | DIVISION I  |
| C DIV II   | COMPARABLE  | DIVISION II |
|            |             |             |
| O DIV I    | OTHER       | DIVISION I  |
| O DIV II   | OTHER       | DIVISION II |

Appendix X

**Foothills School Division AISI ICT Project**

**Year One Steering Committee Report**

***"Extending Teacher and Student Capacities  
by combining authentic learning  
with robust technologies"***



**28 November 2001**

**Tony Hampshire**

**Project Administrator**



## **Table of Contents**

**Project Overview      2**

**Year One Results      3 - 5**

**Professional Development      5**

**Year One Budget Summary      6**

**Appendix "A"      7 - 17**

Sample ICT Implementation Survey

ICT Implementation Results 2000-01

**Appendix "B"      18 - 20**

Sample NCREL Survey of Engaged Learning

Engaged Learning Progress Summary 2000-01

## **Overview**

### **Project Description**

The Foothills AISI ICT project provides an on-site team to offer support, in-school workshops, coaching, and demonstrations for teachers to enhance the implementation of the Information and Communication Technology (ICT) curriculum.

### **Project goal**

An integrated project that will encourage teacher growth and development in order to implement the new ICT curriculum with particular emphasis on student's use of technology as a tool for thinking, collaborating and communicating.

### **Operating Model**

This implementation project utilizes intensive site-based work with teachers and students in order to inservice all Foothills schools in ICT over a three year period from 2000-01 to 2002-2003.

Year One Schools: Big Rock, Blackie, Sen. Riley, Oilfields High ("Orbit 1")

Year Two Schools: Highwood, Foothills Composite, Okotoks Jr., CI McLaren, Percy Pegler ("Orbit 2")

Year Three Schools: Turner Valley, Longview, Cayley, Joe Clark, Spitzee ("Orbit 3")

Galileo Schools: Dr. Morris Gibson, Red Deer Lake, Millarville (site work in all three years)

## **Roles**

### **ICT Implementation Team**

- Provides on-site classroom support, in-class modeling, peer coaching, mentoring, curriculum and lesson design, planning and implementation for infusing technology into the curriculum.
- Creates, develops and conducts staff development for teachers and administrators.
- Conducts teacher leadership sessions including a Summer Institute and monthly learning sessions
- Works with parents and students to provide background learning experiences
- Comprises three FTE seconded staff:
  - Barb Martin, Lead Teacher (Galileo)
  - Jerry Blake, Lead Teacher
  - Tony Hampshire, Lead Teacher/Project Administrator

### **Galileo Educational Network**

- 

Provides direction and support to three schools through Galileo staff members over the three year period.

- Works as part of the Coordinating and Management Committee to provide overall direction to the project, develop and provide PD activities, (Workshops, in-class support, team planning, mini sessions)

ng and Management Committee to provide overall direction to the project, develop and provide PD activities, (Workshops, in-class support, team planning, mini sessions)

- Provides liaison with the Universities for the deployment of interns and graduate students.
- Interacts with the universities around research projects related to this initiative.

### **Technology Services**

- Works as part of the Coordinating and Management Committee to provide overall direction to the project.
- Provides technical support and liaison with the Technology Council and the Technology Services Department.
- Facilitates the purchase and installation of any equipment needed for the project.
- Facilitates any physical equipment or software adjustments needed

### **Learning Services**

- Works as part of the Coordinating and Management Committee to provide overall direction to the project. As a part of this to provide direction to the ICT Implementation Team and assist as required to develop and provide PD activities
- Supports/encourages the day to day work of the ICT team.
- Provide logistical support for the project (Budgets, Data Collection, Meeting Organization, Notices, Coordination with Administration and Schools, Coordination with other PD activities, Interface with other AiSi Projects etc.)

### **Project Goals**

1. To facilitate adult learning to allow teachers to more successfully implement the ICT Program of Studies in their schools.
2. To foster change in teaching practice toward a more constructivist, inquiry-based approach
3. To increase teacher fluency and confidence in implementing the ICT Program of Studies

4. To increase students' ability to perform the Assessment Tasks provided by Alberta Learning
5. To increase the effectiveness and relevance of university and field collaboration by successfully completing a pilot for a new model of pre and post degree programs.

#### Year One Results

#### **Goal 1: To facilitate adult learning to allow teachers to more successfully implement the ICT Program of Studies in their schools.**

Baseline: 20.0%

Target: 40.0%

Actual: 46.0%

We administered a locally developed survey instrument (see Appendix A) to 94 teachers in the 7 schools involved in the first year of the project, to determine where our teachers were with respect to technology integration in Sept./Oct. 2000, and again in June 2001 to measure growth over time. The baseline represents the % of teachers who indicated in Sept./Oct. of 2000 that ICT had a significant to high impact upon their professional practice. The target was a 20% increase in significant to high ICT ratings for teachers involved in their first year of the project. Actual growth in teacher capacity to successfully integrate technology exceeded the target. Please see Appendix A for detailed results.

#### **Goal 2: To foster change in teaching practice toward a more constructivist, inquiry-based approach**

Baseline: 20.0%

Target: 30.0%

Actual: 34.4%

We administered the NCREL (North Central Regional Educational Laboratory) *Survey of Engaged Learning* to 89 teachers in the 7 schools involved in the first year of the project (see Appendix B). This survey was administered in Sept./Oct. 2000 to determine where their current teaching practice was with respect to constructivist teaching practices. The baseline value represents the % of teachers who indicated that their teaching practices consistently engaged students in constructing personal knowledge and inquiry-based projects. The target represents a 10% increase from September to June for teachers involved in their first year of the project. The NCREL survey was administered again in June 2001 to measure growth over time. Actual growth in teacher practice toward a more constructivist approach exceeded the target. Please see Appendix B for detailed results

#### **Goal 3: To increase teacher fluency and confidence in implementing the ICT Program of Studies**

We administered a locally developed survey instrument (see Appendix A) to 94 teachers in the 7 schools involved in the first year of the project. Teachers were asked to assess their levels of confidence and understanding in implementing the ICT Program of Studies, as well as the pedagogical impacts of this curriculum at the beginning of the project in September/October 2000, and again in March 2001. Teachers responded using a four point scale to assess this as "None", "Marginal", "Significant" or "High". Survey results indicated:

- An overall increase of 52% in the proportion of teachers indicating that their level of confidence in implementing ICT was "Significant" or "High"
- An overall increase of 44% from Sept./00 to March/01 in the proportion of teachers indicating that their overall understanding of the ICT Program of Studies was "Significant" or "High"
- An overall increase of 48% in the proportion of teachers indicating that the impact of ICT upon their classroom instruction was "Significant" or "High"
- An overall increase of 45% in the proportion of teachers indicating that the impact of ICT upon their instructional planning, curriculum development, and professional research was "Significant" or "High"
- An overall increase of 27% in the proportion of teachers indicating that the impact of ICT upon their assessment, evaluation & reporting of student progress was "Significant" or "High"

#### **Goal 4: To increase students' ability to perform the Assessment Tasks provided by Alberta Learning**

Student achievement on AB Learning Technology Outcomes

Baseline: 21.0%

Target: 26.0%

Actual: 43.0%

We administered a locally developed survey (see Appendix A) wherein 94 teachers in the 7 Orbit 1 schools were asked to estimate their students' abilities to perform the ICT Program of Studies Assessment Tasks, and had a random sample of students attempt tasks drawn from the April 2000 draft version of *Alberta Learning's Classroom Assessment Toolkit*. The baseline represents teachers' estimates of the proportion of students whose ICT abilities were seen as significant or high and could ably perform these tasks. The target represents a 5% increase from September to June for students involved in their first year of the project. Actual growth significantly exceeded the target. Please see Appendix B for detailed results.

Note: We were advised that following editorial revision, the final version of the Classroom Assessment Toolkit would be released for use in June 2001. As of October 15, 2001, it remain unreleased and has been withdrawn from the Alberta Learning website. We continue to monitor the availability of this material for use in this project.

**Goal 5: To increase the effectiveness and relevance of university and field collaboration by successfully completing a pilot for a new model of pre and post degree programs.**

Baseline: 0

Target: 1

Actual: 5

The baseline was 0, as no program of this sort previously existed. The target of 1 represented the number of teachers who were expected to earn graduate credit for developing integrated, technology-enhanced units of study under a cooperative program offered by the University of Calgary and The Galileo Educational Network. In actuality, 5 Foothills teachers participated in this program and earned post degree credit during 2000-2001.

In 2000-2001 we were unable to execute the coordination of pre-service placements with the University of Lethbridge and the University of Calgary to the degree planned, due to their internal requirements. We did coordinate pre-service placements with the University of Calgary Masters of Teaching (MT) program through a Special Topics Seminar co-taught by Dr. Pat Clifford and Dr. Sharon Friesen of Galileo. Two U of C MT students were purposely placed in a Foothills school, based upon their individual curricular expertise and interests in technologically enabled environments and inquiry-based pedagogy.

Note: Foothills schools working with Galileo are part of a collaborative evaluation project entitled "*Evaluation of Learning Technologies: Initiatives in Continuing Professional Development*". The principal researcher is Dr. Bert Einsiedel, the Director of the Institute for Professional Development, the University of Alberta. Dr. Michele Jacobsen of the University of Calgary is the researcher leading the evaluation in the Foothills Galileo schools. We anticipate that Dr. Jacobsen's first year report will be released shortly.

### **Professional Development**

Indicators of PD progress appear in the evaluations of ICT Professional Development sessions provided by project personnel to professional staff in 2000 - 2001. These sessions were planned to increase teacher knowledge of the ICT Program of Studies and to facilitate its implementation. Teachers and administrators rated the quality of these sessions on a five point scale using "Poor", "Fair", "Good", "Very Good" and "Excellent" as descriptors. All PD sessions were highly rated as indicated below:

| Session Date | Excellent | Very Good | Good | Fair | Poor |
|--------------|-----------|-----------|------|------|------|
| Oct. 23/00   | 55%       | 35%       | 10%  | 0    | 0    |

|              |     |     |     |   |   |
|--------------|-----|-----|-----|---|---|
| Nov. 9/00    | 66% | 33% | 0   | 0 | 0 |
| Feb. 21/01   | 40% | 50% | 0   | 0 | 0 |
| Aug.22-24/01 | 45% | 36% | 18% | 0 | 0 |
| Oct. 5/01    | 67% | 24% | 9%  | 0 | 0 |

Indicators of PD progress can also be drawn from the amount of daily site-based work that project personnel undertook directly with teachers in 2000-01:

School Site Visits 314

Whole Staff ICT demos 22

Classroom ICT demos 80

Lead/team teaching classes 450

Teacher consultations 155

ICT/ Planning consultations 130

It is noteworthy that several ICT projects developed by Foothills teachers were awarded funding under the federal SchoolNet GrassRoots program and/or Telus2Learn.

### **Year One Budget Summary**

The project completed year one slightly under budget, expending 89% of available funds. Unexpended funds were largely attributed to substitute release time unused or banked by some schools in 2000-01. These funds will be carried forward into 2001-02 for these schools, ensuring that they receive their full allotment of release time.

| Funding Source                   | Approved Budget | Actual Expenditures | Variance |
|----------------------------------|-----------------|---------------------|----------|
| Unexpended Funds                 | 316280          | 302466              |          |
| AISI Funding                     | 0               | 0                   |          |
| Funding from Other Sources       | 0               | 0                   |          |
| Total Available Funds            | 316280          | 302466              |          |
| Staffing & Benefits              | 191427          | 170729              | 6.54     |
| Supplies & non-staffing services | 22000           | 18924               | 0.97     |
| Equipment                        | 47000           | 46576               | 0.13     |
| Other Capital                    | 0               | 0                   | 0        |

|   |        |        |      |
|---|--------|--------|------|
| Other Expenses (PD,<br>sub release days)                  | 55853  | 44300  | 3.65 |
| Other Authorities   | 0      | 0      | 0    |
| Total Expenses  | 316280 | 280529 |      |
| Unexpended Funds<br>(deficit/carry forward to<br>2001-02) | 0      | 21937  |      |
|   |        |        |      |

## Appendix Y

### Transcript Dissemination

| Colour of Highlight | Area of Focus           | Statements reflecting interview responses  |
|---------------------|-------------------------|--|
| YELLOW              | Use of additional staff | <ul style="list-style-type: none"> <li>• <i>Allowed an individual to come into our school that was here once a week.</i></li> <li>• <i>Continual support</i></li> <li>• <i>To have an on site person, once, twice a week was an incredible amount of learning that went on.</i></li> <li>• <i>An AISI leader, I guess (name) in our school</i></li> <li>• <i>Kind of unique because we did have (name) in the school a resource person that didn't have to teach other classes, he was just there for everybody</i></li> <li>• <i>So I don't know if it is Galileo</i></li> </ul>  |
| NEON GREEN          | Staff more focused      | <ul style="list-style-type: none"> <li>• <i>It allowed for a chance to learn about curriculum and technology.</i></li> <li>• <i>Increased awareness in information gathering abilities</i></li> <li>• <i>AISI projects like this helps you to focus and give you some goals to work towards as a staff and as an individual teacher</i></li> <li>• <i>It gave me, uh, the opportunity to learn at the ground level what some of the programs. I didn't have to go and take another course elsewhere, it was offered at school..</i></li> <li>• <i>Well I think it helps you focus your efforts, time and efforts on that particular project it provides a focus</i></li> <li>• <i>Encourages people to get involved when they might not otherwise have. It involves extra coaching, extra people to help so that people can learn to use the technology..</i></li> </ul> |
| DARK BLUE           | System problems         | <ul style="list-style-type: none"> <li>• <i>... and tech support because of the high technological need of this new hardware we need support in keeping it functioning.</i></li> <li>• <i>Some of the shortcomings might be the computer systems that we have, just trying to do some of the projects and then the glitches that the computers have</i></li> <li>• <i>.</i></li> </ul>   |
| PINK                | Time factors - positive | <ul style="list-style-type: none"> <li>• <i>Direct hands on time.</i></li> <li>• <i>Teachers could take time to work with that individual and he was there to give us a hand</i></li> <li>• <i>(name) available once a week for us to go to, to ask for help</i></li> <li>• <i>The fact that teachers are able to take time</i></li> </ul>   |

|            |                         |   |
|------------|-------------------------|---|
|            |                         | <p><i>off and work on that specifically during the day, is much superior to try to do it after school.</i></p>  |
| PINK       | Time factors - negative | <ul style="list-style-type: none"> <li>• <i>We still need to have time to practice the skills that each, that I have and the staff have on a regular basis</i></li> <li>• <i>The days we were allowed for (name) to be here were not my computer days and when I tried to book (name) to help me in the classroom he was available for twenty minutes for me throughout the whole year to work with my kids.</i></li> <li>• <i>The timetable wasn't flexible enough, that I could switch computer classes for him to come help out</i></li> <li>• <i>They got to have time in the lab and that is hard to get know.</i></li> <li>• <i>Our kids are only allowed so much time with. . computers.</i></li> <li>• <i>You can only do so much with kids because of the time restrictions.</i></li> </ul>  |
| GOLF GREEN | Follow-up               | <ul style="list-style-type: none"> <li>• <i>I think that rather than having orbit 1,2,schools, it needs to b e an Orbit school for a longer time, rather than just one year, technology changes too fast, inn order to keep that . . .</i></li> <li>• <i>I think it needs to be on an ongoing basis for a while to get part a parcel to become a patter to become a habit.</i></li> <li>• <i>It would be nice if during staff PD activates if we had kind of like a sharing time or each staff meeting each staff meeting one person shared an idea or something they've done in their class that way we make sure we've got time to do that cause lots of people are doing great things in their room but we often don't hear about it cause there's not enough time to do that so if you like to set up a schedule or something that people could take turns and share a project or an idea</i></li> <li>• <i>So another thing was that the follow up wasn't good.</i></li> <li>• <i>There was no follow up for the teacher to see if we had troubles with that, how it worked out or if it was successful or simple.</i></li> <li>• <i>We briefly, very briefly, had time to share some of our ideas, I think doing an in-service after school at a staff meeting and saying let's everybody build one of these or let's look more in-depth, we just sort of were introduced to what other staff members were doing we weren't given an opportunity to learn how to do that . . .</i></li> </ul> |

|            |                   |  |
|------------|-------------------|--|
|            |                   | <p><i>and sometimes we don't know what other staff members are doing so there is no consistency from grade to grade or ability to share, share those types of projects.</i></p> <ul style="list-style-type: none"> <li>• <i>Well, to me, I'd say, the immediate shortcoming this year is that now that we've kind of gone through it for a year, we're not getting as much support this year so not surprisingly, some of the focus has fallen off.</i></li> <li>• <i>Probably in my experience, staff member, I think that maybe one thing that would be more useful would be more required work on the part of the teachers, almost like I know it's good to have it coming from the teachers and make it theirs, but I think that sometimes there needs to be a little initiative from the other end of things and maybe if there was perhaps a little higher expectation on the staff to share with other people and so on, that would be something that would be worthwhile.</i></li> <li>• <i>Accepting and supporting. We bounce ideas off each other on how we can incorporate technology</i></li> </ul> |
| GOLD-BROWN | Hardware concerns | <ul style="list-style-type: none"> <li>• <i>ICT requires larger equipment, better equipment and the hardware needed to compliment what we do.</i></li> <li>• <i>Computer systems</i></li> <li>• <i>Not enough computers</i></li> <li>• <i>Not enough hardware in schools</i></li> </ul>  |
| PURPLE     | Student growth    | <ul style="list-style-type: none"> <li>• <i>Increased awareness in information gathering abilities to utilize and choose appropriate communication media styles and formats appropriately. Uh, the projects that are being put out are a lot more complex and integrated.</i></li> <li>• <i>CD yearbook, a lot of programming and new ways of presentation of student work, electronic portfolios comes to mind, as an end product tool, kids were discovering and learning and wanting to learn.</i></li> <li>• <i>We used technology, we've used the digital camera and the kids last year, the kids most of the kids knew how to use it and they can use discs to put in and d get things off discs they used it to make graphs for their portfolios and published poems they became rally skilled at using the basics of Power Point and word and excel and even the internet too. That maybe they wouldn't have otherwise.</i></li> <li>• <i>The power point presentation in (grade) the most</i></li> <li>• <i>Students had never seen or used power</i></li> </ul>  |

|           |           |   |
|-----------|-----------|---|
|           |           | <p>point and they were highly successful. They were more able to use the common "I" drive for some of the web pages that I put together for them so they're were able to access the information better. And they are more comfortable on the computer.</p> <ul style="list-style-type: none"> <li>• Well there's certainly a much increased ability among the students to use technology within their various projects throughout the curriculum so definitely they've improved in their ability to use the technical aspects of most of the programs that we have at the school</li> <li>• I'm just amazed at what the kids know about computers. If you don't know how to do something just ask them. I think it's evident all the time whenever you take kids to a computer lab you see evidence.</li> <li>• Some kids are really good with computers and other technology and they really get motivated I find, by using computer, they enjoy it.</li> <li>• Kids are way more open ended when they think about using technology. They are finally realizing the possibilities an they're seeing it as like the technology help you, kids can see it's more efficient.</li> </ul> |
| TEAL BLUE | New idea? | <ul style="list-style-type: none"> <li>• In terms of integrating it as part of all of the curriculum I think that that's a fairly new concept</li> <li>• I think it's new in the way that it was done and development of an AISI project, it allowed a more versatile type of implementation</li> <li>• I guess the way that it was done was unique</li> <li>• It's new, it's the first time I've been involved in any such program.</li> <li>• I would say with AISI and ICT going hand in hand in our division that's perhaps the most support we've had at any level for any kind of curriculum implementation. I would say so in terms of the level.</li> <li>• I think there's more invested in this one. I'm guessing, I'm not sure, but that's my perception because it is a big learning curve for a lot of staff and it is a different way of thinking a different way of learning kind of thing</li> </ul>  |
| RED       | Old idea? | <ul style="list-style-type: none"> <li>• Yes I do because they did it in sort of a pyramid approach where they took people to Edmonton and trained them in the new social studies curriculum and they came out and trained at the district level and</li> </ul>   |

|             |                       |   |
|-------------|-----------------------|---|
|             |                       | <p>then every school had someone who was trained to do the implementation</p> <ul style="list-style-type: none"> <li>• Yeah I think it has been done in the past it just seemed like every year there's something different that is being integrated be it art or literacy or computers.</li> </ul>   |
| ORANGE      | Successful?           | <ul style="list-style-type: none"> <li>• Yes</li> <li>• I think it was a very successful way to implement new curriculum</li> <li>• Yes absolutely</li> <li>• Well I thought for me it was successful</li> <li>• Yeah, I think it's definitely successful</li> <li>• Yes I do</li> <li>• Yeah, I think so</li> <li>• Oh I 'm assuming so</li> </ul>   |
| BLACK       | Why successful?       | <ul style="list-style-type: none"> <li>• Good way because of the way the world is technology is so integrated into our everyday life that this is just an extension of that</li> <li>• Because it gave time for staff to learn to practice and then put into use. Time factor was a major component. To have an on site person once, twice a week was an incredible amount of learning that went on.</li> <li>• To have (name) in this school was wonderful.</li> <li>• I learned a lot it depended on how much I was willing to put into such a project. I liked the hands on approach of having school time available to work on it. We did some staff activities as well as were able to work as a team on different programs different part of it so the school was all focused so you weren't by yourself.</li> <li>• Funding and the fact that there's time set-aside within the day where teachers can work on those projects. I think that's crucial</li> <li>• Every school had someone trained to do the implementation</li> <li>• Integrating it is easier than just giving you something new.</li> <li>• They're putting a lot of money in it.</li> </ul> |
| SEA BLUE ✓  | Knows AISI definition | <ul style="list-style-type: none"> <li>• 7/8 know the proper definition</li> </ul>  |
| SEA BLUE ☒  | Knows ICT definition  | <ul style="list-style-type: none"> <li>• 5/8 know the proper definition</li> </ul>  |
| INTEGRATION | Computer integration  | <ul style="list-style-type: none"> <li>• I've always had to integrate language throughout all curricula so maybe its new in that its mandated, of integrating it throughout</li> <li>• It is an integrated curriculum</li> <li>• Projects that are being put out are a lot more complex and integrated.</li> </ul>  |

|                            |  |   |
|----------------------------|--|---|
|                            |  | <ul style="list-style-type: none"> <li>• <i>Just learning more about it, improving my computer technology via courses and understanding and implanting the program in the classroom</i></li> <li>• <i>Students use technology within their various projects throughout the curriculum</i></li> <li>• <i>To integrate technology within the curriculum</i></li> <li>• <i>People will be able to utilize technology in a more embedded way. For a lot of staff it is a different way of thinking a different way of learning kind of things and it is an embedded curriculum so that in itself is different, its not a discipline.</i></li> </ul> |
| <p><b>BLACK CIRCLE</b></p> | <p>Can ICT be used to implement provincial achievement testing</p> | <ul style="list-style-type: none"> <li>• <i>I don't know if you could mandate that cause I don't see how you can measure that.</i></li> <li>• <i>Probably</i></li> <li>• <i>No</i></li> <li>• <i>No</i></li> <li>• <i>I think it would be difficult to do.</i></li> <li>• <i>I suppose it would be a way to do that</i></li> <li>• <i>No</i></li> <li>• <i>They can try</i></li> </ul>  |