IMPROVING TECHNOLOGY PROFESSIONAL DEVELOPMENT

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Dedication

I dedicate this work to my husband Michael and my children Danielle and Taylor for their constant love, support and encouragement throughout. You are my inspiration.

Abstract

The purpose of this project is to identify effective technology professional development practices and to provide direction for future professional development in the Holy Spirit School Division as it relates to integration of ICT Outcomes. Factors considered in identifying effectiveness of professional development activities included teachers' perceptions of:

1. appropriateness in content and applicability
2. relevance to their teaching assignment and their delivery of the Alberta ICT Outcomes
3. sustainability and support for review and further learning in the area

An online survey was administered to teachers in the Holy Spirit School District during the spring of 2004. Five recommendations emerged based on the findings:

1. facilitate ongoing technology infused curriculum meetings,
2. develop and support District and school based leadership,
3. provide for a variety of technology professional development opportunities,
4. budget effectively for evergreening of technology, and
5. focus technology integration on the improvement of student learning.

Acknowledgements

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Table of Contents

List of Tables

Table

List of Figures

Figure

Chapter 1: Introduction

Over the past 5 years, the Holy Spirit School Division has been involved in the planning and delivery of various technology professional development activities for teachers within the district. During this time, all areas of teacher preparedness in the delivery of the Information and Communication Technology (ICT) Outcomes have shown growth. In this project, teachers in Holy Spirit Schools were surveyed in order to identify effective professional development practice as it relates to integration of the ICT Outcomes. Factors taken into account include demographic information such as grade level, school and subjects taught; ways in which teachers use technology themselves; ways in which teachers use technology with students and effectiveness ratings of various types of technology professional development. The analysis of the survey data will provide direction and focus for future professional development in the Holy Spirit School Division.

Background

In June of 1998, Alberta Education released, *Information and Communication Technology, Kindergarten to Grade 12: An Interim Program of Studies*. This document reflected feedback received from parents, school councils, school boards, school superintendents, the Alberta Teachers' Association (ATA), business and other interested citizens in response to an initial draft ICT Program of Studies. Mandatory partial implementation of the new ICT Outcomes began in September 2001 with the goal of having all classrooms in the province of Alberta achieve full implementation by September 2003. Between 1996 and 2003, Holy Spirit School Division provided a variety of opportunities for professional learning for teachers in the area of technology, including

school based workshops, division-wide grade level and subject area sessions as well as support for workshops, conferences and courses offered through the Southern Alberta Professional Development Consortium, the University of Lethbridge, the Lethbridge Community College and various professional organizations. In January of 1996 and January of 2000, the school division conducted technology surveys to assess the progress and needs of all stakeholders in the area of integration of technology into classroom practice. This report will study current realities and future direction for technology integration, teacher preparedness and professional development needs within the Holy Spirit School Division. The survey used in previous years was rewritten to accurately reflect current realities and to focus more specifically on analyzing the professional development needs of teachers within the school division.

Chapter 2: Literature Review

The purpose of this section is to examine literature related to technology integration and technology professional development. The first topic considered is pedagogy underlying successful infusion of technology into classroom practice. The second topic discussed is effective technology professional development that is built on research of adult learning and the change process involved in adopting new teaching tools and practices. Finally, some of the obstacles to effective technology professional development will be discussed.

Pedagogical Perspective

In Alberta Learning's *Professional Development For Teaching Technology Across The Curriculum: Best Practices For Alberta Schools* (1999), it is acknowledged that "technology across the curriculum" (p. 3) requires teachers to "significantly change the way they work with students and facilitate learning."(p. 1) Constructivism is identified as a key concept in teaching with the new technologies. "Constructivism must be **student-centered** and **authentic**. Students no longer simply study "about science; they "do" science. They do not merely memorize historical facts; they research, think and write as young historians." (p. 7) Scheffler & Logan expand by stating that, "knowing how to access information, evaluate knowledge sources, and apply knowledge to issues and problems are primary learning expectations for students in today's schools." (1999) Professional development for teachers, then, goes far beyond how to run the computer to encompass whole new approaches to teaching and learning. If technology is to facilitate the learning of higher order skills and knowledge, it may require teachers to examine their teaching practices. The "best practices" document recognizes that it is

natural for teachers to feel less effective before seeing the positive effects of new teaching practices. Fullan (2001) describes this "dip in performance and confidence as one encounters an innovation that requires new skills and new understandings" (p. 40) as the *implementation dip*.

At the heart of integration of ICT outcomes is the hope of improved student learning. Simply adding technology into the curriculum will not produce guaranteed benefits to student learning. The technology movement is coupled with definite shifts in pedagogy from behaviorist models to constructivist models of learning encompassing student-driven, student-centered, project based, hands-on learning (Alberta Learning, 1999; Byrom, 1998; Carvin, 1999; Corcoran, 1995; Lieberman, 1996; Peck, Cuban & Kirkpatrick, 2002 and Serim, 1996). Teachers need to know more than just how to *do technology*. They need strategies and practices that will help them to alter rather than support their existing teacher-centered practices (Peck et al., 2002). Beaudin (1998) describes technology and educational change as a complex issue involving much more than mere technological expertise. Sound pedagogical practice was found to be one significant factor underlying successful change. Rodriguez (2000) states that "educational technology is not, and never will be transformative on its own.... It requires the assistance of educators who integrate technology into the curriculum, align it with student learning goals, and use it for engaged learning projects." (Issue section, para. 1)

Technology Professional Development

There are various kinds of learning, teachers will engage in, including developing technology skills, using technology to enhance student learning, and integrating technology in subject areas. All of these areas work together in motivating teachers to

seek professional development. For instance, a teacher may first need to see how student learning can be enhanced through the use of technology before desiring to use it. As a result, the teacher would seek technology skill development to effectively facilitate student learning. "Comparison of competency studies since the 1980s indicate that proficiencies essential to new technology implementation tend to transition from awareness, to knowledge and practice in basic operational skills, to building the skill into routine classroom instructional and management tasks." (Sheffler & Logan, 1999, Comparison section, para. 1) The teacher, then, integrates technology into classroom practice in increments as new technology skills are acquired.

Parr (1999) confirms the importance of "incremental integration into classrooms" (p.7) in noting the gap between teachers' ability to use technology productively for personal and professional use and their willingness to incorporate technology within their classroom curriculum. Following intensive professional development over a four year period, teachers reported significant increases in their "ability to operate a computer system in order to successfully utilize software," and demonstrate "skills in using productivity tools for professional and personal use" (Parr, 1999, p. 6). Similar increases were **not** reported in "designing and developing student learning activities that integrate computing and technology for a variety of student grouping strategies and diverse populations" (Parr, 1999, p. 6). Eifler, Green and Carroll (2001) reiterate this concern in stating that many professional development activities in the area of technology are led by people with business, computer science or math backgrounds. "These otherwise knowledgeable people are not necessarily the best equipped to provide the assistance

teacher educators need to imagine the possibilities for integrating technology meaningfully into their instruction" (Eifler et al., 2001, p.368).

Carvin (1999) points out that "teaching an educator how to use Netscape or conduct an Internet search only scratches the surface of what he or she needs to know in order to successfully utilize the Internet in the classroom" (p. 4). He goes on to point out that teachers need to be exposed to "constructivist teaching styles or community-building professional development opportunities among their peers" (Carvin, 1999, p. 4) in order to carry this over into their classroom practice. Byrom (1998) found that "when professional development and technical assistance start with a particular teaching or learning strategy that the teachers believe will benefit their students...and then help teachers discover ways technology is a tool that supports the strategy, teachers are usually eager to try both the new instructional strategy and the technology." (5^{th} Factor section, para. 1) It has been this researcher's experience that teachers need to take a creative leap in using technology in new and meaningful ways with their students. Teachers "must become 'fearless in their use of technology' and empowered by the many opportunities it offers" (Rodriguez, 2000, Overview section, para.1). "We must begin to think of ourselves as designers" (Clark, 1992, p.77)

Guskey (2002) points out that teachers are motivated to participate in professional learning when they can see that their efforts will be rewarded with improved student learning. Teachers need to believe that professional development "will expand their knowledge and skills, contribute to their growth, and enhance their effectiveness with students." (Guskey, 2002, p. 382) Guskey (2002) argues that changing teachers' beliefs and attitudes involves a cyclical process where they learn through professional

development, try it out in their classrooms, see changes in student learning and thereby change their beliefs and attitudes. DuFour's (2002) concept of *Professional Learning Communities* supports this position in that he believes that the focus of effective school reform and professional development should first be on students learning needs. The goal of student learning should be the guiding light for professional development. The focus, shifts away from teaching to *what are the learning needs of our students* and *how can we ensure that our students learn?* Strahan (2003) describes a *spiral of reform activity* which involves teachers working together to develop stronger instructional strategies. This in turn enhances student achievement and strengthens collaborative bonds between teachers. Teachers need to know that professional development will help them to create better learning opportunities for their students.

The best practices document states that new approaches to teacher professional development are necessary for success in the area of technology. Professional development needs to be systematic, systemic and sustained. One-time workshops are not sufficient in bringing about long term effective change in teaching practices. In Bloom's taxonomy of learning, effective technology integration would involve multiple levels of abstraction. Teachers need to feel comfortable in the area of knowledge or basic understandings before they are able to effectively operate at the application level. Eifler et al. (2001) echo this point in referring to the importance of teacher's ability to imagine the possibilities in the development of lessons utilizing technology.

Best Practices identifies effective types of professional development for Alberta Teachers in the area of technology. Workshops generally involve small focused topics in which participants learn a bit of how to use the tools of technology along with classroom

applications. Often, the downfall of technology based workshops is that there is little opportunity for teacher reflection, planning, follow up with workshop presenters or collaboration with colleagues.

Mentoring and peer support projects involve teachers working in small groups over a longer period of time in order to support one another in their professional development. Some examples would be the Galileo Teacher Secondment Project, Summer Institutes and the Shaw Teaching and Learning with Technology Initiative.

In Holy Spirit Schools, grade level and subject area meetings provide structure and support for mentoring. These recurring meetings provide professional development activities that "enhance teachers' curriculum, learning, and assessment competencies and skills as well as classroom and instructional management competencies." (Rodriguez, 2000, Curriculum specific section, para. 1) This is accomplished through teachers forming partnerships with others who have similar teaching assignments and working together to share, develop, implement and reflect on curriculum based technology infused lessons. Corcoran (1995) affirms that, "if teachers are to teach for deep understanding, they must be intellectually engaged in their disciplines and work regularly with others in their field." (Guiding practices section, bullet 5)

Technology can also be used to facilitate professional learning. Calgary Catholic School District has developed self-guided booklets to assist teachers in their independent learning. Online courses and tutorials support anytime, anywhere learning. E-mail groups provide mutual support for ongoing interaction and problem solving. Video and integrated media can allow teachers to observe model teaching practices or view and analyze their own teaching. Videoconferencing is opening new possibilities for

connecting and collaborating with world renowned presenters from home-based locations.

Best Practices highlights two long-term, more comprehensive projects categorized by the authors as Innovative. They are the Pegasus Project and the TELUS Learning Connection (TLC). The Pegasus project focuses on Action Research for teachers while the TLC uses a province wide cascade model for professional development.

The Pegasus project utilized an inquiry approach for teachers focusing on student learning. Teachers developed a "practical theory about how learning is affected when technology is used as a learning and teaching tool." (Alberta Learning, 1999, p. 79) Teachers identified areas of concern with teaching and technology, developed a hypothesis, then, planned, implemented, observed, reflected and revised their strategy based on observed results. One of the main strengths of this approach to technology professional development is that the process models that which teachers are expecting of their students in an inquiry-based classroom.

TLC provides in-service to 240 Teacher-Leaders selected from all school districts within the province. The Teacher-Leaders, in turn provide leadership and direction for professional development opportunities for teachers within their school district. This is supported by a world class, Alberta based web site. It has grown exponentially through teacher submitted web sites, lesson plans and telecollaborative projects based on Alberta curriculum. One particularly successful component of the TLC website has been support for telecollaborative projects. Taking advantage of grassroots funding, teachers in Alberta have participated in and initiated numerous telecollaborative projects over the past 6 years. Harris and Grandgenett (2002) found that in addition to demonstrated

evidence of enhanced learning opportunities for students, teachers who participated in curriculum-based online projects with their students "report authentic professional development to a considerable degree." (p.54) Teachers reported that through engaging their students in telecollaborative projects, they were enhancing their own learning in the areas of teaching practices; technology, presentation and communication skills; classroom management; organization, instructional design and lesson planning and variety of teaching and learning strategies.

Alberta teachers are now expected to submit annual professional growth plans to help provide direction and structure to their ongoing learning. In the past 3-5 years, the need to learn skills associated with technology integration have dominated many teachers plans. Teachers' desire to improve their skills in effectively integrating technology into classroom practice requires both the development of baseline technology skills as well as the exploration and development of sound pedagogical practices for integration into subject areas.

Obstacles to Effective Technology Professional Development

Learning new technologies takes time. Learning new ways of teaching takes time. Teachers have a very busy and demanding professional life. New curriculums are introduced every year, new programs are introduced and new initiatives for school improvement are developed. Teachers' time outside of the classroom is devoted to planning, marking, reading, collaborating with other teachers, professional development, extra-curricular work with students, communication with parents, and committee meetings with school staff. Unfortunately, the public and policy makers tend to believe that teachers are only working when they are with their students.(Grant, n.d.) When

working to meet expectations of educational reforms such as integration of technology into teaching and learning, teachers "need more time to work with colleagues, to critically examine the new standards being proposed, and to revise the curriculum. They need opportunities to develop, master and reflect on new approaches to working with children." (Corcoran, 1995, para. 2) The need for teachers to be able to step back and reflect on their learning requires time. Take, for example a full time teacher who attends a traditional *sage on the stage* professional development workshop. They plan for a substitute teacher to cover their classes for the day, attend the workshop and hear dozens of wonderful new ideas and approaches and then return the next day to their classroom to unravel what happened while they were away, mark student work and plan for the next days' lessons. There is no time to stop and reflect on what has been learned or how to incorporate it into their regular classroom. Reflection time needs to be built into the professional development, time to think and time to discuss and plan for incorporation of new ideas with colleagues. "On the whole, most researchers agree that local professional development programs typically have weak effects on practice because they lack focus, intensity, follow-up, and continuity." (Corcoran, 1995, Impact section, para. 2)

Rodriguez (2000) discusses alternative ways to find time for professional development through scheduling teacher preparation times to allow for collaboration, block scheduling, and banking time by adding minutes of instruction onto the school day to free up non-instructional days during the school year. Grant (n.d.) describes an innovative program used in the Monterey California Model Technology Schools where "SuperSubs" were hired. These substitute teachers came in equipped with a technology infused lesson for students that the regular classroom teacher teachers did not have to

plan. They provided release time for the classroom teacher work with other teachers to improve their own technology skills, while giving students technology-based learning experiences.

Based on this review of the literature, the implications for technology professional development are clear. Time and time again, research reminds us that effective professional development needs to be an ongoing process rather than an event. (Cook, 1997; Fullan, 2001; Grant, n.d.; Guskey, 2002) This is especially true with educational technology due to rapidly changing technologies and the necessary pedagogical shifts for many teachers. Sheffler & Logan affirm that, "instructional content for technology training programs cannot be static. Competencies must be reviewed constantly and revised to address current technology." (1999, Conclusions section, para. 1) Effective professional development also requires inquiry, interaction and problem solving opportunities. Teachers need to learn in ways that they are being expected to teach in order to internalize both the processes and skills they expect of their students. "To create inquiry-based environments for their students, teachers themselves need experience with learning in inquiry-based environments." (Grant, n.d., Beyond section, para. 7) Time will continue to be an issue for teachers and schools will need to continue to look for creative ways to free up teachers for professional learning and reflection. Technological advances are beginning to facilitate new forms of delivery of professional development that enable teachers to broaden their scope of learning.

Chapter 3: Method and Procedures

Research Question

This project examined the question: "What types of professional development have been most effective in the past five years in helping teachers to effectively integrate technology into classroom practice?" Factors considered in identifying effectiveness of professional development activities were teachers' perceptions of:

4. appropriateness in content and applicability
5. relevance to their teaching assignment and their delivery of the Alberta ICT Outcomes
6. sustainability and support for review and further learning in the area

Sub Questions

In analyzing the results, numerous sub-questions were addressed to identify relationships between demographic factors, professional development needs and how teachers use technology with students. Sub questions include:

- Is there a relationship between computer familiarity and how teachers are using technology with their students?
- Is there a relationship between the Division level taught and how teachers are using technology with their students?
- Is technology being integrated more in some Division levels than others?
- Is there a relationship between computer familiarity and technology professional development needs?
- Is there a relationship between the Division level taught and the technology professional development needs?

Questions relating to subject area and technology integration will only be touched on with caution due to problems associated with respondent interpretation of the question. This will be discussed further in the *Findings and Analysis* section of this document.

- Is there a relationship between subject area taught and how teachers are using technology with their students?
- Is there a relationship between the number of different subjects taught and how teachers are using technology with their students?
- Is technology being integrated more in some subject areas than in others?
- Is there a relationship between the number of different subjects taught and technology professional development needs?
- Is there a relationship between subject area taught and technology professional development needs?

Based on the teacher survey responses, future directions for professional development in the area of ICT integration in Holy Spirit Schools will be recommended.

The Survey Instrument

During April of 2004, an online survey was sent to all 271 teachers in the Holy Spirit School District. (See Appendix A) The survey included demographic information such as school, grade and subject taught, baseline personal assessment of technological skills, identification and assessment of ICT professional development experiences in the past five years and recommendations for future ICT professional development. The survey included multiple-choice, Likert-type rating and open-ended short answer questions. Through the school district technology committee, school based technology Teacher Guides were oriented to the survey and its purpose. They provided input and

helped to coordinate the administration of the survey within their own school. School principals provided input and approval of the survey at their regularly scheduled principal meeting. With the support of school principals and school based technology Teacher Guides, teachers were oriented to the purpose and significance of the survey. Each teacher in the school district was invited to participate in the survey through e-mail and in person by the researcher, the school principal and/or the school based technology Teacher Guide. The survey was available online in electronic format. All responses are included in the analysis of results.

The survey instrument was designed to address all teachers in the Holy Spirit School District in Kindergarten to Grade 12. Despite all the attempts to acknowledge the diversity of teaching assignments, some oversights occurred. Question #1 allowed teachers to choose one of 5 grade level distinctions. Some teachers teach in more than one division level and others teach in specialized areas such as principal, librarian and special education. These choices were not provided on the survey instrument. A similar problem occurred with question #2 where teachers were asked to identify their school. Some teachers work in more than one school. In question #3, respondents were asked to select the age of their home computer. Many teachers have more than one home computer. However, this problem had an insignificant impact since it affected relatively few respondents.

Questions # 7 and #8 were somewhat parallel in asking how much time teachers spend per week on their computer at home and at school. The researcher did not ask how much time was spent at work for personal computer use. The intent was to create some sort of measure of computer familiarity but it was naive to assume that there would be

negligible amount of time spent on school computers for personal use. The most problematic question was question #13. Respondents were asked to select the average time per week their students spent using computers in class. They were asked to select *N/A* if they did not teach the subject and *none* if they taught the subject and did not have students using the computer in this class. Responses showed that this question was clearly misinterpreted when elementary teachers reported using computers with students in classes such as biology, chemistry and physics. In addition, many elementary teachers who would logically teach 6- 8 different subjects left all subjects as *N/A* and reported a time for 1 or 2 subject areas. With correct interpretation of the questions, they should have selected *none* for all the subjects that they teach that they do not use computers in. Based on these observations, results for question #13 need to be viewed with some hesitancy.

Due to a glitch in the data collection, no results were collected for the open ended question #17: *What has been the most effective technology professional development you have participated in?* The researcher will rely on the effectiveness ratings given to various types of professional development in the Likert scale responses of question #16 in order to answer this question. Please refer to Appendix A for a complete listing of professional development types rated.

Definition of terms

Throughout the survey, a number of terminologies are used which require clarification. The terms used in the survey are familiar to most respondents based on shared history in the Holy Spirit School District and our common evolutionary experiences in technology professional development.

Teacher. For the purposes of this study, the term *teacher* referred to all practicing teachers in the Holy Spirit School Division. It was intended to include classroom teachers, specialist teachers, administrators and teacher librarians. It did not include substitute teachers, nor did it include support staff.

Teachers were asked to rate the effectiveness of various types of technology professional development. These types of technology professional development have all been available to Holy Spirit teachers over the past 5 years to varying degrees.

Technology skill development workshop. A *technology skill development workshop* is a workshop which focuses primarily on technology or a specific software. A variety of technology skill development workshops have been offered within the school district for such software programs as Microsoft Excel, Microsoft Word, Microsoft Power Point, Kid Pix, Kidspiration, Inspiration and Macromedia Flash. Creation of web pages would be another example of a technology skill development workshop. A technology skill development workshop may or may not be a one shot affair.

Technology focused courses. *Technology focused courses* were courses offered through the Lethbridge Community College and the University of Lethbridge. The college courses tended to be business oriented, and were often focused on mastering one or more software programs. University courses, were often more curriculum based such as "Internet and Education," "Computers in the Classroom," and the "Science and Technology Summer Institutes." One of the main features of a technology focused course would be that it is ongoing over a period of time and includes more than one session.

Technology focused conferences. A *technology focused conference* would be an intense one to four day theme based workshop. Some examples are the annual Career and Technology Studies and Computer Council Conferences.

Online courses and online tutorials. *Online Courses* in the area of educational technology are readily available through many institutions throughout the world. Online courses are led by a course instructor and generally allow the student flexibility through online, information sharing, discussions and assignment postings. They may or may not include a face to face component but usually begin and end within a predetermined time frame. In contrast, *online tutorials* are available through the Internet to download and use at any time. They usually do not involve interaction with an instructor or classmates.

E- mail groups and listserves. *E-mail groups and listserves* are another variation of online learning. The key feature here is that there is interaction through information sharing with others sharing a similar interest. Examples would include subscription to a commercial electronic mailing list such as Macromedia, Jasc or Mailbox.com; or professional organizations such as the Association for Supervision and Curriculum Development, Alberta Teachers' Association specialist councils, or the Alberta Learning Technology Stakeholder group.

Internet resources and web sites. *Internet resources and web sites* are meant to refer to readily available online resources that support teaching and learning in the area of educational technology. This is a very broad category and could be further broken into sub categories such as resources that support learning technology skills, resources that support curriculum areas, resources to support teachers, online resources for student use,

teacher or student created web resources, free and user pay resources, to name a few. For the purposes of this study, Internet resources and web sites are lumped into one category.

Books, journals and other educational technology print resources. *Books, journals and other educational technology print resources* are another source of professional development available to teachers. Some of our schools hold current subscriptions to technology related print material and some teachers utilize teacher guide books and software print guides to enhance their technological expertise.

Technology Coordinator. During the 1999 - 2000 school years, the Holy Spirit School District employed the full time services of a *Technology Coordinator*. This person was responsible for coordinating technology related professional learning opportunities for all teachers in the district. The role included school visits, workshops and working one on one with individual teachers. In addition, the current structure of school based Teacher Guides and the TELUS Learning Connection Team was initiated by the district Technology Coordinator.

Teacher Guide. Each school has at least one teacher designated as the school based *Teacher Guide*. Their primary role is to assist teachers in their school with the integration of the ICT outcomes. In addition, school based Teacher Guides manage day-to-day needs of teachers on technology integration and curriculum issues, act as contact person to Network Operations/Equipment Technician(s), and identify and act on professional development needs and plan for professional development. School based Teacher Guides have also often taken on the role of technical supporter within their schools. This role requires maintaining and managing the hardware and software of the school, day to day technical maintenance, licensing of software, cleaning of hardware (in

conjunction with care-taking staff), addressing network issues or contacting Network Operations/Equipment Technician(s) for guidance or assistance, and clearing out of internal network systems, disposal of older equipment. The school based technology Teacher Guide is usually a full time teacher. It is recommended that this person receive compensation for their services through preparation time, release time from regular classes and relief from supervision responsibilities.

TELUS Learning Connection (TLC) team. The *TELUS Learning Connection (TLC) team* consists of four members. The team has been in effect since 1998 working initially under the direction of the technology coordinator. When the coordinator position was not renewed in the 2000 - 2001 school year, the team continued to provide leadership in technology professional development in consultation with the Deputy Superintendent of schools and the school district Technology Committee. The role of the TLC team has evolved over time and has included providing professional development for technology integration for teachers within the school division, providing professional development for technology integration for student teachers within the school division, preparing for delivery of Teacher Guide workshops, working with teachers and administrators, individually and in groups. The TLC Teacher Leaders have structured professional development delivery by designating each of the 4 Teacher Leaders to a particular division level as well as designating each Teacher Leader a number of schools to liaison with. Release time for the TLC Teacher Leaders has been provided through school pooled funding and the TELUS Learning Connection provincial initiative. Currently, all four of the TLC Teacher Leaders are assigned full time teaching or administration duties within their schools with one 40 minute preparation time per week to fulfill their TLC

roles, and up to 7 days per school year of substitute teacher costs. Over the past 3 years, the release time provided to the TLC team through school pooled funding has been gradually funneled back to the schools to support the development of leadership in school based technology Teacher Guides.

Grade level and subject area meetings. *Grade level and subject area meetings* were formally worked into the TLC team work plan during the 2000 – 2003 school years. Over three school years, 5 half day sessions were held for each grade level in Kindergarten to Grade 6 and each core subject area in Grade 7-12. Sessions focused on presentation of knowledge, skills and ideas and group sharing of ideas and strategies on the integration of information and communication technology outcomes into curricular areas.

Telecollaborative Internet projects. *Telecollaborative Internet projects* have been used extensively by many teachers in Holy Spirit Schools over the past five years. Based on informal information gathering by this researcher, teachers in Holy Spirit Schools have initiated and received funding from Industry Canada for approximately 200 projects. Since 1998, seventy different teachers in the school district have been involved as Project Lead Teachers, bringing approximately $181,000 into their schools. All schools in the district have been involved in telecollaborative projects to varying degrees. Evidence of these projects is available online in the technology section of the Holy Spirit School District website, www.holyspirit.ab.ca.

Youth initiatives project. The *Youth Initiatives Project* operated in the Holy Spirit School District during the 2001 to 2004 school years. Each year, between 4 and 8 technology support workers were hired for up to 16 weeks each year through a grant from

Industry Canada. Technology students from the Lethbridge Community College were assigned to schools where they assisted the school based technology Teacher Guide with the integration of the ICT Outcomes into curricular areas. The youth worked largely in one on one or small groups with teachers and students. The duties performed by these youth in the area of technology were many and varied based on needs of individual communities, schools, teachers and students:

- Assisted with updating of district, school and classroom web sites,
- Assisted with workshops for groups of teachers in the area of telecollaboration and project development,
- Worked with individual teachers during the school day and after school hours to assist with development of skills in technology – word processing, Power Point, Excel, Flash, Web Page Development, using e-mail,
- Assisted with class projects – an extra pair of hands in a computer lab is a very welcome enhancement to classroom climate,
- Worked with individuals and small groups of students to provide support in using technology as a learning tool – scanning, editing images, animation,
- Conducted on line research to find relevant web sites to support learning for teachers in the areas of student curriculum and teacher professional development,
- Provided technical assistance by loading programs, troubleshooting computer hardware, software and networks,
- Provided assistance to staff as they worked on building their own material for classroom use.

More details of the Youth Initiatives projects are available online at the Holy Spirit Web site at http://www.holyspirit.ab.ca/~lorelie.lenaour/abouttlc.html.

Class release time. In some schools, teachers have used telecollaborative funds, personal professional development funds and school funds to hire substitute teachers. This has enabled them to use class release time to improve their technology skills. Often teachers use this time to work together on telecollaborative projects or work one on one or in small groups with TLC Teacher Leaders or the school based Teacher Guide.

Peer tutoring or mentoring. In some schools, the Teacher Guide to teacher or the TLC Teacher Leader to teacher relationship has become formalized to the point that it could be classified as peer tutoring or mentoring. This has occurred where small groups of teachers have worked together on areas of common interest over longer periods of time. In some schools, teachers have used their preparation time or class release time to observe other teachers with their classes.

Observing other classes. *Observing other classes* has occurred in computer lab and classroom settings and is preceded and followed by peer discussion and mutual sharing.

Chapter 4: Findings and Analysis

The research methods used in this study are descriptive and correlational. An attempt has been made to examine and describe the current state of teacher preparedness as well as teachers' daily practice in the infusion of ICT outcomes. In addition, we will examine the level of effectiveness of various types of technology professional development as rated and described in survey responses.

Participation

Comparison of current and previous technology surveys. The 2004 Holy Spirit Technology Survey was administered entirely online. Every teacher in the Holy Spirit School district has access to a reliable Internet connection. Over the past 6 years, the District Technology Committee and the Network Operations Specialists have worked hard to ensure that connectivity is reliable and consistent between schools. The researcher has assumed that all teachers in the Holy Spirit School District possess the technology skills necessary to complete an online survey. Evidence from the 1996 and 2000 technology surveys show that the teacher response rate has remained very consistent between the three surveys. In 1996, 140 teachers submitted responses to the paper and pencil technology survey and in 2000, 145 teachers participated. The response rate for this survey, administered online, was 146 out of 271 teachers. In 1996, 84% of teachers reported owning a home computer and 16% had Internet access at home. In 2000, 88% of teacher respondents owned a home computer and 66.2% had Internet access at home. In 2004, 96.6% of respondents owned a home computer and 84% had Internet access at home. The obvious and expected trend is more teachers with home computers have Internet access and are gaining skills in the use of technology. The 2004 results,

however, could be slightly inflated due to what Howard (2004) refers to as the "subtle selection bias" (p. xvi) associated with online survey administration. It could be that the "sampling strategy presented a picture...that is far more wired than the population-at-large." (Howard, 2004, p. xxxi) Respondents with home computers and Internet access would be more likely to be comfortable with the online survey format and more inclined to submit their responses. It is possible that some teachers not proficient or uncomfortable with technology have been excluded due to inability to participate online.

Although the response rate over the three surveys remained constant, the nature of who responded may have varied. The researcher encouraged all teachers to respond, whether they had positive, negative or neutral comments to contribute. As will be seen in the analysis of results, a range of satisfaction and proficiency levels were represented. As far as sample selection is concerned, it is likely that those respondents who responded to the survey have an interest in the area of technology professional development in the school district and would, in turn be those most likely to participate in future professional development opportunities. If this study indeed provides direction for future technology professional development in the Holy Spirit School District, then the study sample is a valid sample.

In reality, the most significant advantage to the online survey format was the ease of administration and collection of survey results for the researcher. "Web-based survey also eliminates the time and expense of data entry because this is performed by the respondents in the course of the survey." (Howard, 2004, p. xvii) During the testing phase of the survey, it was discovered that the "submit" button was missing. The first 15 respondents printed their responses and the researcher later manually input them. Later a

further four surveys were sent by facsimile to the researcher due to loss of the Internet connection while completing the survey. Respondents reported that the survey was straightforward and quick and easy to complete.

Participation rates by division level have remained fairly constant through the three administrations of the technology survey as illustrated in Table 1.

Table 1.

Participation rates by division level for the 1996, 2000 and 2004 technology surveys

Division Level	% Participation		
	1996	2000	2004
Division I	31%	35%	33%
Division II	22%	28%	28%
Division III	26%	21%	22%
Division IV	8%	16%	16%
Undetermined	13%	10%	1%
Total	100%	100%	100%

2004 technology survey. This survey was promoted through word of mouth from the researcher, the school principal and the school based technology Teacher Guide as well as through e-mail messages. The Survey response rate varied between schools from 18.5% to 100% participation. The Holy Spirit School district had an overall response rate of 53.9% or 146 of the total 271 teachers. Figure 1 illustrates the response rate for each of the thirteen schools. Schools are represented by a number rather than name to ensure anonymity.

The specific school by school differences in administration of the survey were reflected in participation rates. Survey administration was discussed personally with each school principal. Based on the principal's direction, the survey was distributed to staff. School 11, 13 and 5 had all teachers complete the survey at one time during a scheduled staff meeting or professional development day. (Some teachers were absent from school that day) At school 4, the researcher met with all staff at a staff meeting to promote the purpose and importance of participation in the survey. At 6 schools the researcher obtained a list of all teachers and invited participation through personal e-mail messages to all. At the remaining 7 schools, the school principal forwarded the personal invitation from the researcher from his/her e-mail account. All school principals promoted participation in the study through verbal encouragement and reminders to their teachers. After the initial personal meeting with each school principal, the principals were reminded of the time lines for survey completion in two follow up e-mail messages from the researcher. The researcher extended a personal invitation through direct e-mail or face to face contact with staff at schools 2, 3, 4, 5, and 13. The researcher has worked personally with many teachers at schools 2, 3, 5, 11, 13 over the past 6 years as a TLC

Teacher Leader. This personal connection likely enhanced participation rates at the schools.

Respondents represented all grade levels throughout the district. Figure 2 shows the number of respondents by Division level. There is a comparable number of teachers in the total population in each Division level except for the Kindergarten level which would only include about 1/5 as many as each of the other categories. This is reflected in the sample size. Kindergarten was kept as a separate category because curriculum, computer use and especially hours in school vary significantly from the rest of Division I.

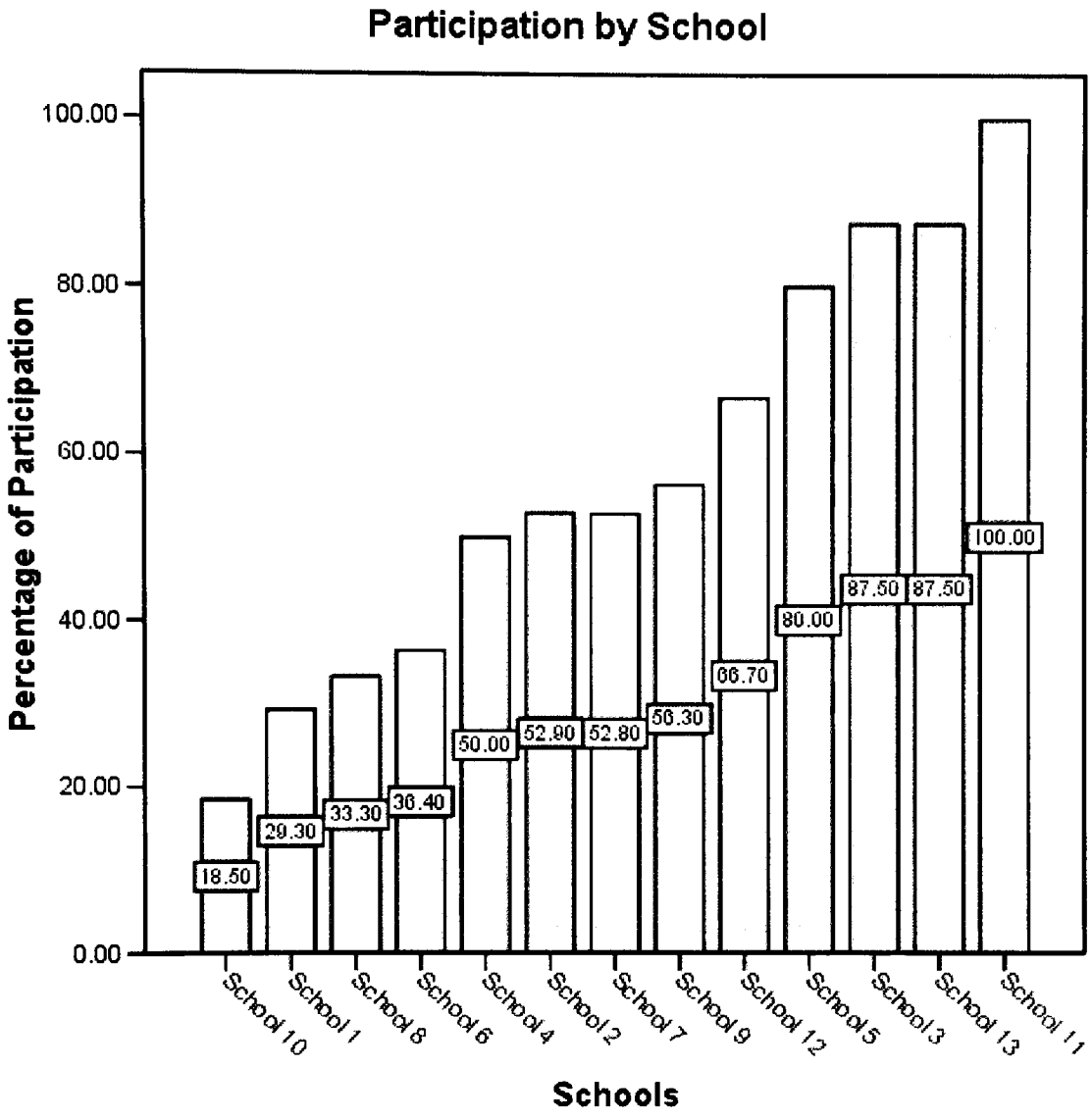


Figure 1. Participation by school

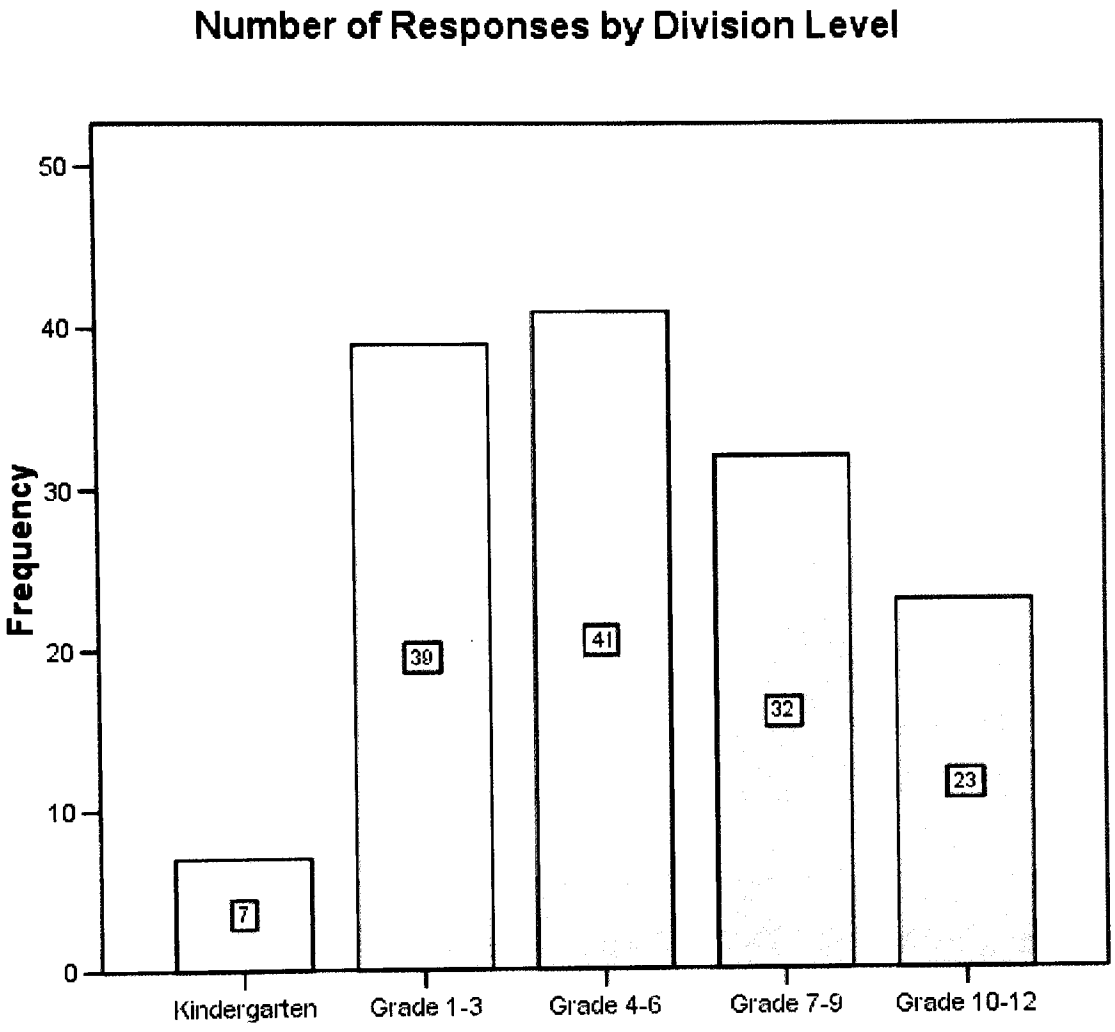


Figure 2. Participation by division level

Teacher Technology Competence

Teachers were asked to assess their personal skill level regarding computer technology. Figure 3 shows that 1.4% of respondents claimed to have no interest in technology, 16.6% rated themselves as beginners, 48.3% rated themselves as intermediate, 29.7% chose above average and 2.8% rated themselves as expert computer users.

Teachers' self reported skill level aligned with their reports of newness of home computer, home Internet access, number of different computer uses and number of hours spent on the computer each week. For those respondents who had a home computer newer than 2 years, 50% assessed their own skill level as above average or expert. In contrast, 3.5% of respondents who had a home computer older than 5 years or no home computer assessed their own skill level as above average or expert. Respondents with home Internet access assessed their personal skill level higher than respondents without home Internet access. Of those with home Internet access, 35% ranked their skill level as above average or expert while only 16% of those without home Internet access ranked their skill level as above average or expert. Table 2 summarizes the responses for newness of home computer and home Internet access with self reported skill levels.

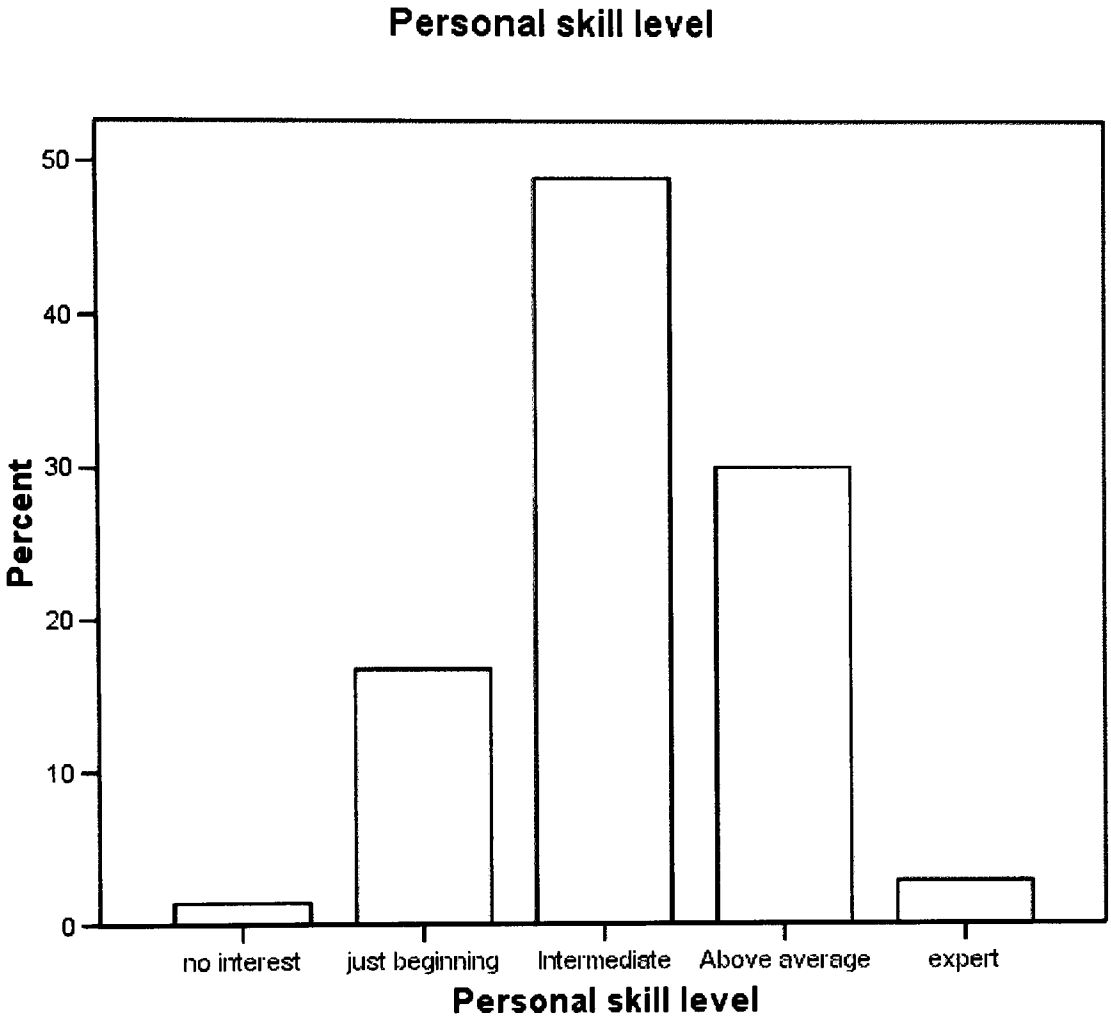


Figure 3. Teacher self assessment of technology skill level

Table 2.

Crosstabulation for newness of home computer and home Internet access with skill levels

			Personal skill level					
			No Interest	Just Beginning	Intermediate	Above Average	Expert	Total
Newness of Home Computer	don't own a home computer	Count	0	1	4	1	0	6
		% within Newness of Home Computer	.0%	16.7%	66.7%	16.7%	.0%	100.0%
	more than 5 years	Count	1	4	16	3	1	25
		% within Newness of Home Computer	4.0%	16.0%	64.0%	12.0%	4.0%	100.0%
	2-5 years	Count	1	10	32	13	2	58
		% within Newness of Home Computer	1.7%	17.2%	55.2%	22.4%	3.4%	100.0%
	newer than 2 years	Count	0	9	18	26	1	54
		% within Newness of Home Computer	.0%	16.7%	33.3%	48.1%	1.9%	100.0%
Total		Count	2	24	70	43	4	143
		% within Newness of Home Computer	1.4%	16.8%	49.0%	30.1%	2.8%	100.0%
Home Internet access	no	Count	1	3	12	3	0	19
		% within Home Internet access	5.3%	15.8%	63.2%	15.8%	.0%	100.0%
	yes	Count	1	21	58	39	4	123
		% within Home Internet access	.8%	17.1%	47.2%	31.7%	3.3%	100.0%
Total		Count	2	24	70	42	4	142
		% within Home Internet access	1.4%	16.9%	49.3%	29.6%	2.8%	100.0%

Teachers' number of different uses for computer technology reported also supports their self assessed level of competence. Only 3 respondents out of the total 142 valid responses rated themselves as expert. All 3 respondents validated their claim by stating that they used computers for 11 to 12 different uses. Above average computer users selected 8, 9 or 10 different uses 51.3% of the time. Intermediate computer users selected 8, 9 or 10 uses 65.7% of the time while beginners selected 8, 9 or 10 uses 45.9% of the time. Only 2 respondents selected no interest in computers and they claimed to use the computer for 5 and 6 different uses. The bar chart in Figure 4 summarizes the number of computer uses for each personal skill level.

Table 3 shows the breakdown of types of computer use reported by teachers in each division level. Class preparation; newsletters, memos and letters; professional e-mail, chat groups and listserves; Internet research; and location of web sites that match a particular curriculum goal were the most popular forms of computer use. As will be seen in the next section in the analysis of types of effective professional development, very few teachers report participation in chat groups or listserves, therefore the high response to this category reflects teachers' use professional e-mail a great deal.

Although a high number of teachers use computers for record keeping, this activity is much more concentrated in the upper grades with 100% of senior high school teachers using computer assisted record keeping, 96.9% of junior high teachers, 70% of grade 4-6 teachers and 56.5% of Kindergarten to grade 3 teachers.

The least used computer applications were digital video, producing class web pages and production of art or graphics. Both production of class web pages and production of art and graphics were more prevalent in Kindergarten to grade 6. This is

evidence of the large number of teachers in Division I and II who have initiated telecollaborative projects in which web pages are a requirement of the project completion and funding. Other uses of computer technology identified by teachers included financial planning, tessellations, simulations, online courses, data base and spreadsheet applications.

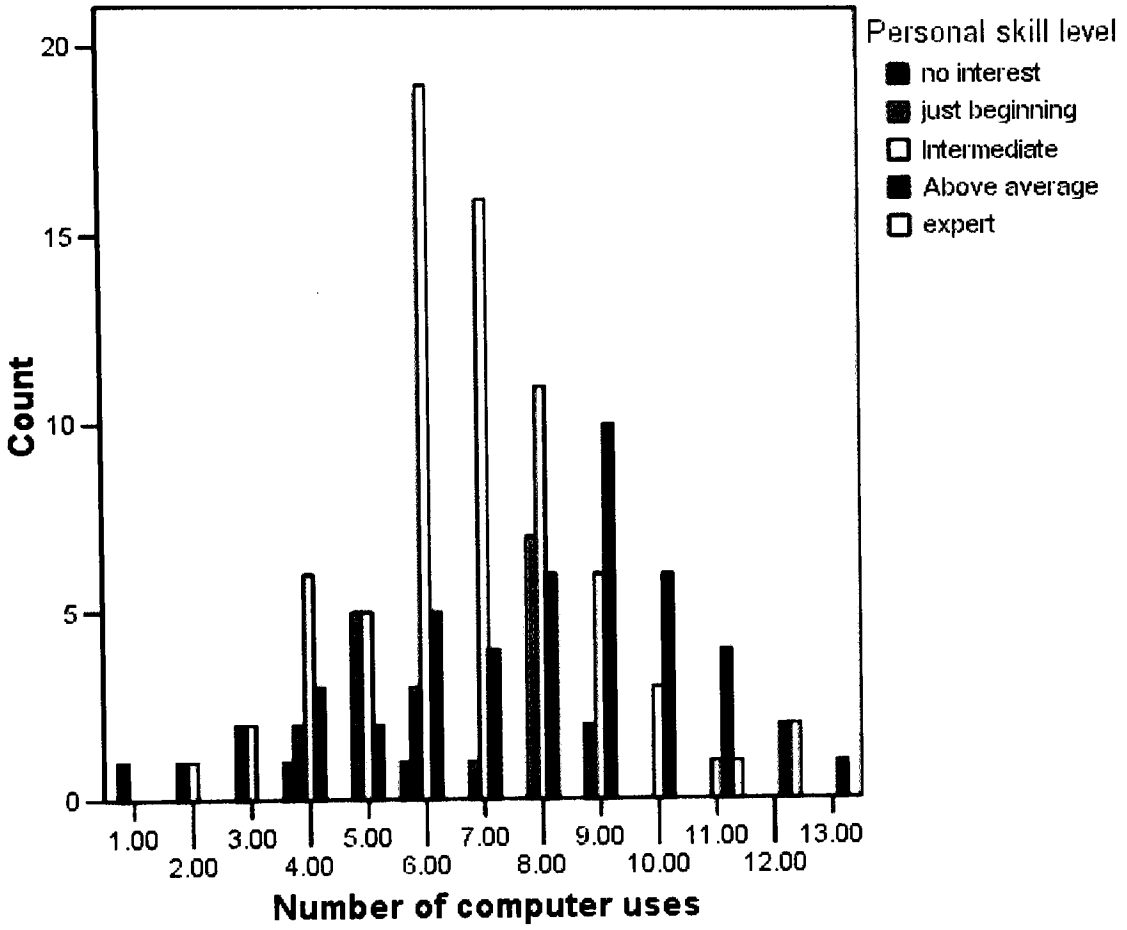


Figure 4. Number of computer uses for personal skill levels

Table 3.

Computer uses by teachers for division levels

	Division I	Division II	Division III	Division IV	Overall
Class Preparation	76.0%	87.8%	90.6%	95.7%	85.9%
Record Keeping	56.5%	70.7%	96.9%	100%	76.8%
Instruction for in-class demonstrations	39.1%	61.0%	31.3%	91.3%	52.1%
Newsletters, memos, letters	93.4%	82.9%	71.9%	87.0%	84.5%
Professional e-mail, chat groups, listserves	84.7%	82.9%	84.4%	91.3%	85.2%
Producing class web pages	28.2%	24.4%	12.5%	17.4%	21.8%
Production of multimedia	43.4%	65.9%	56.3%	65.2%	56.3%
Production of graphics or art	36.9%	29.3%	18.8%	34.8%	30.3%
Internet research	91.3%	95.1%	100%	91.3%	94.4%
Location of web sites that match a particular curriculum goal	65.2%	73.2%	59.4%	78.35	68.3%
Digital photography	39.1%	56.1%	31.3%	56.5%	45.1%
Digital video	10.8%	7.3%	6.3%	21.7%	10.6%
Other	4.3%	4.9%	3.1%	8.7%	5.0%

Teachers who report higher levels of computer skill competence spend more time on the computer each week than teachers who report lower competence levels. Expert users reported using the computer from 18 to 36 hours each week. Above average computer users reported using the computer for 18 to 29 hours 53.5% of the time. Most beginners (62.5%) use the computer between 6 and 12 hours each week, while 52.9% of intermediate users use the computer between 6 and 12 hours each week. The bar chart in Figure 5 summarizes the hours of computer use reported in the categories for home and school work and personal computer use combined into 6 groupings.

Teacher technology competence, therefore, takes into account a number of related variables. A numerical value of competence was tabulated for each respondent based on the sum of positive responses to newness of home computer, access to the Internet at home, number of years using computers, personal ranking of technological skill level, hours of computer use at school and at home for both work related and personal use and number of different uses for computer technology. The highest score possible was 63 points and the lowest was 4. The responses submitted by Holy Spirit School teachers ranged from 16 to 61 points. The histogram in Figure 5 shows the reported range and distribution of teacher technology competence.

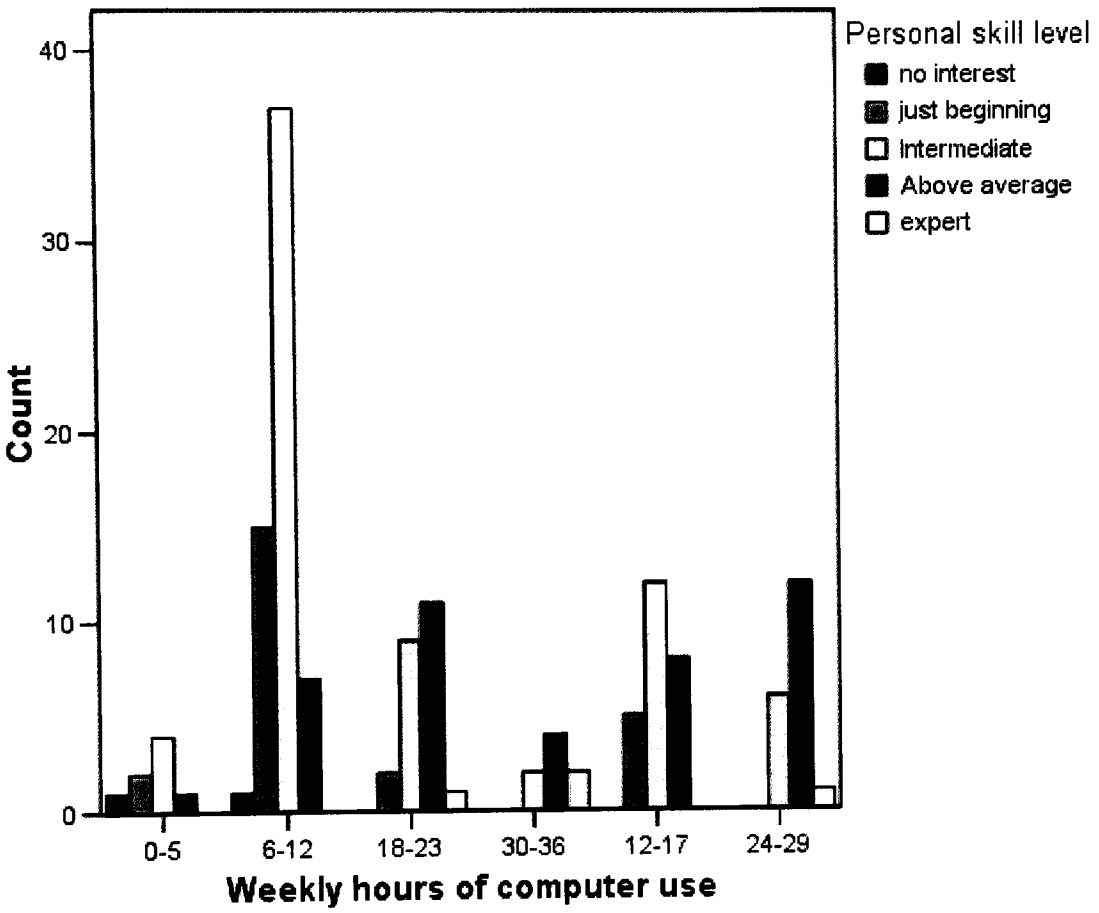


Figure 5. Weekly hours of computer use for skill levels

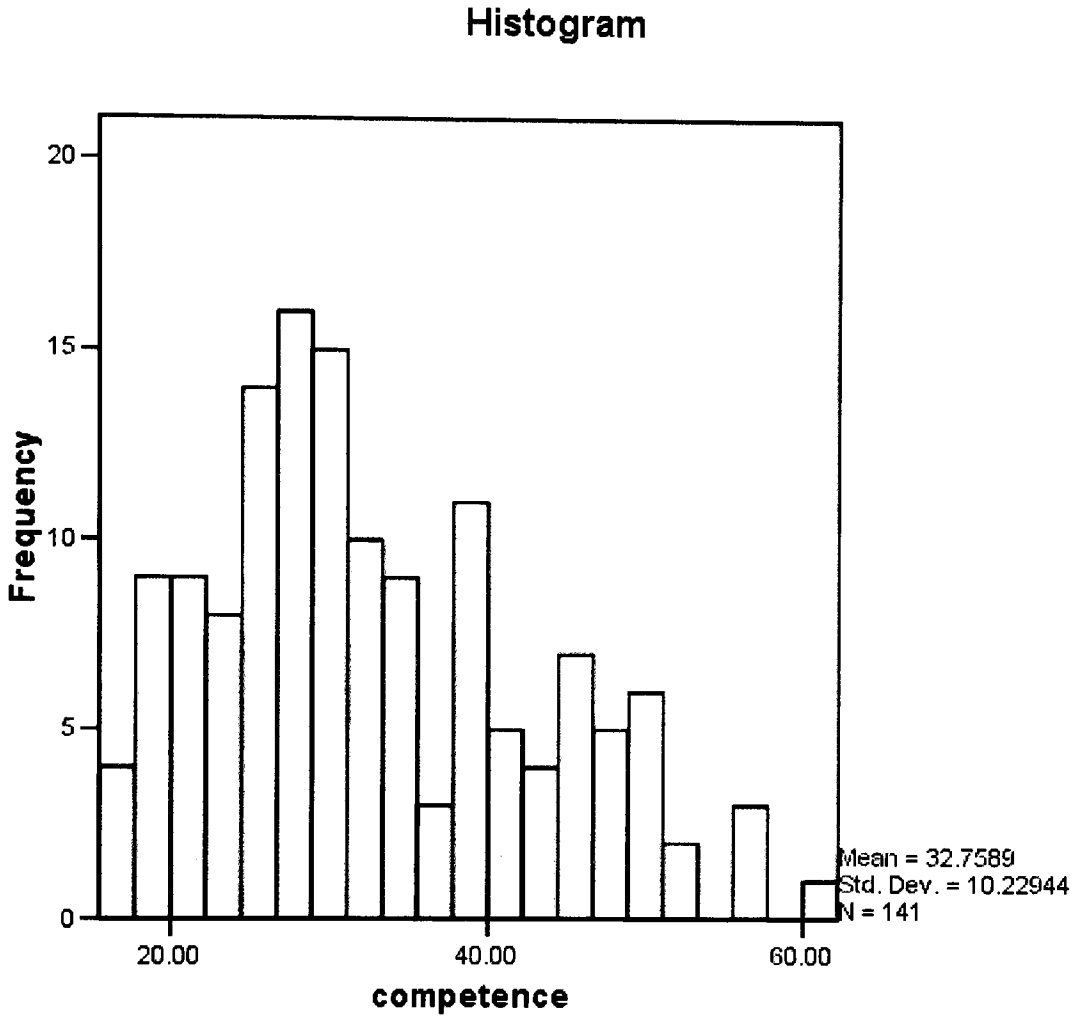


Figure 6. Histogram of reported teacher technology competence

Student Uses of Technology

Teachers in Holy Spirit schools report using computers with students in a number of different ways. Almost 61% of teachers reported using technology with students in 4 to 8 different ways. About 23% reported using technology with students in 3 or fewer different ways and 16% reported using technology with students in 8 or more different ways. A range of student uses appeared in every Division level. Using regression analysis, a correlation coefficient of .597 and an R square value of .357 were obtained for teacher number of uses and student number of uses for technology. A correlation coefficient of .318 and an R square value of .101 were obtained for teacher personal skill level and student number of uses for technology. A correlation coefficient of .413 and an R square value of .171 were obtained for teacher hours of computer use per week and student number of uses for technology. The overall teacher competence score had a correlation coefficient of .464 and an R square value of .215 with number of student uses. It appears, then that generally, the more competent the teacher is with computer technology, the more likely they are to integrate a larger variety of student uses of technology into their program.

As can be seen from Table 4, overall the most common use of technology for students in all division levels is for word processing. Other common student uses were Internet use, keyboarding and reward games. Some student uses such as computer assisted learning, drawing and painting, keyboarding and participation in telecollaborative projects were more popular in Division I and II, while activities such as data gathering and analysis, e-mail use, presentation software use and creating web pages

were more common in Division III and IV. This data supports the learner outcomes as described by division level in Alberta Learning's ICT Outcomes.

Table 4.

Computer uses by students for division levels

	Division I	**Division II**	**Division III**	**Division IV**	**Overall**
Publishing / Word Processing	67.3%	87.8%	81.3%	82.6%	78.9%
Data gathering and analysis (spreadsheet / database applications)	17.3%	56.1%	31.3%	65.2%	39.4%
Computer assisted learning (learn from software that teaches academic content, review, practice, reinforce basic skills	71.7%	53.7%	28.1%	47.8%	52.8%
E-mail use	19.5%	17.1%	31.3%	39.1%	24.6%
Internet use	52.1%	85.4%	62.5%	82.6%	69.0%
Drawing and painting	86.9%	56.1%	31.3%	17.4%	54.2%
Planning (e.g. mental mapping, organization, webbing, flowcharting, outlining)	8.6%	19.5%	6.3%	17.4%	12.7%
Presentation software (e.g. Power Point, Hyper studio)	30.4%	58.5%	43.8%	73.9%	48.6%
Information gathering/ resources (e.g. CD-ROM Encyclopedia)	13.0%	43.9%	43.8%	47.8%	34.5%
Drafting (CAD)	0%	2.4%	0%	13.0%	2.8%
Keyboarding / Typing	71.7%	65.9%	21.9%	30.4%	52.1%
Telecollaborative Projects	39.1%	31.7%	9.4%	4.3%	24.6%
Creating web pages (producing work for online sharing)	15.2%	9.8%	15.6%	26.1%	15.5%
Reward (games)	56.5%	63.4%	43.8%	43.5%	53.5%
Other	2.1%	14.6%	6.3%	4.3%	7.0%

In examining which subject areas teachers are using computers with their students, it became apparent that the most commonly reported amount of time for any subject area was 0-30 minutes per week. In correlating these times with the comments given to the open ended questions, access to current technologies, computer labs and classroom technologies showed up as often cited difficulties. Teachers also expressed frustration with the tight amount of time they have to cover the already challenging subject area curriculums and the need to have technology outcomes inserted directly into existing subject area curriculums. Some teachers are concerned that technology takes more time than traditional methods of completing assignments for students.

Difficulties arise when trying to compare the amount of time teachers devote to technology when their teaching assignments vary greatly from teacher to teacher. In Division I, it is not uncommon for the home room teacher to teach all eight subject areas. As we move up the Division levels, more departmentalization tends to occur and one teacher might teach anything from homeroom to specialization in one subject area. As noted earlier, the survey question was met with some confusion from respondents and so it is questionable whether the respondents meant *none* or *N/A* in regards to not integrating technology into a subject area or not teaching the subject at all. In Division III and IV, numerous teachers noted their frustration in not being able to book time for their students in the computer lab. A teacher who teaches Language Arts all day is not able to book into the computer lab for all their classes and this can make integration of ICT outcomes difficult to impossible. In examining subject area integration of ICT outcomes, it is clear that technology is being integrated in Language Arts, Math, Science and Social Studies to higher degrees than in Religion, Physical Education, Art, Music, Drama, and French.

Technology Professional Development

Section 16 of the online survey had teachers rate the effectiveness of their professional development experiences. Degree of effectiveness was to include appropriateness in content and applicability; relevance to their teaching assignment and the ICT curriculum; and sustainability of learning. Teachers rated each of 18 types of technology professional development on a scale that included *highly effective, effective, undecided, ineffective, highly ineffective* and *not applicable*. In addition, teachers were prompted to add and rate other types of professional development not included in the list. Appendix B includes the crosstabulation tables for each question with a breakdown of responses by division level. In most cases, there was not much difference between division levels in responses to questions. Differences will be highlighted in cases where they were apparent. The responses tended to cluster into three groupings including effective, unpopular, and least favored technology professional development. Figure 7 is a transposed box plot showing median, inter quartile range and total range of responses for each technology professional development type. Professional development types will be examined in reference to the three clusters.

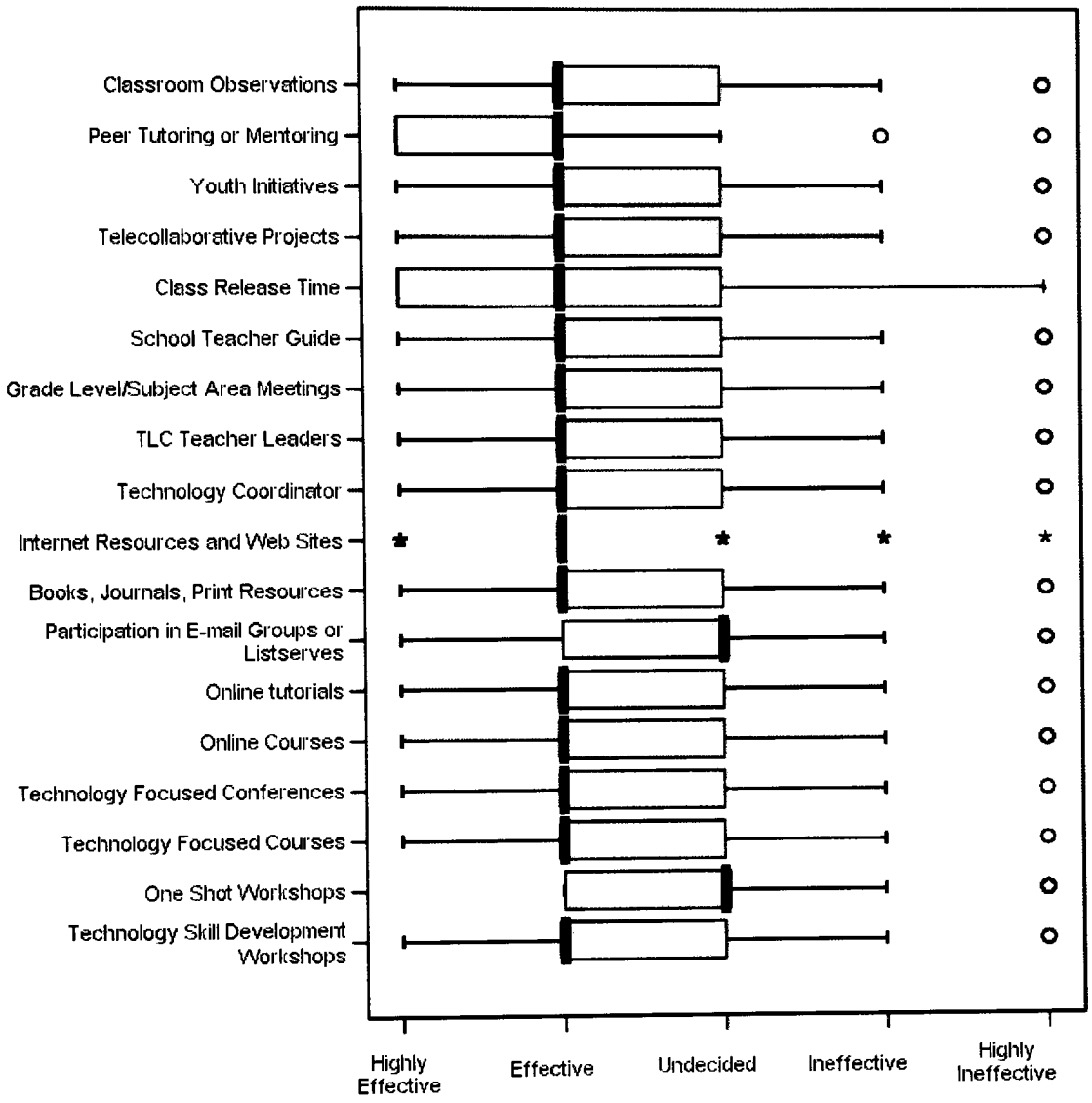


Figure 7. Effectiveness of technology professional development by type

"Effective" forms of technology professional development. Twelve of the eighteen types of technology professional development will be discussed in this section. The median for all of these groups fell in the effective range and a substantial percentage of respondents reported participation in these form of technology professional development. Figure 8 summarizes the findings for technology professional development that was rated as effective.

Peer tutoring or mentoring was reported to be effective or highly effective for 86% of respondents who had participated in this form of technology professional development. Only 2.8% of those who had utilized this form of technology professional development felt that it had been ineffective or highly ineffective professional development. Nearly 21% of all respondents had not participated in peer tutoring or mentoring.

Internet resources and web sites were rated as effective or highly effective for 86% of respondents who had used this resource. Internet resources and web sites were rated ineffective or highly ineffective professional development for 4.1% of respondents who had used the resource. Only 7.6% of all respondents had not used Internet resources or web sites for technology professional development. As can be seen from the professional development box plots in Figure 7 the cluster of over 75% at the effective rating leaves only a few outliers for each of the other responses. It appears that there is agreement at all grade levels in this school division that the Internet is a valuable learning tool for teachers.

Class release time was reported to be an effective or highly effective form of technology professional development by 70% of respondents who had participated in this

form of technology professional development. Only 6.2% of this same group reported ineffective or highly ineffective and 22.9% reported undecided. Class release time was rated as not applicable for 27.8% of all respondents as a form of technology professional development. In the comments section of the survey, respondents mentioned class release time as a need 35 times.

For respondents who had participated, 75.6% felt that technology skill development workshops were effective or highly effective. Only 7.2% of this same group reported technology skill development workshops as being ineffective or highly ineffective. In comparing Grade Levels, 69.6% of teachers from Grade 1-3 reported technology skill development workshops as effective or highly effective, while 75% of Grade 4-6 teachers, 76.7% of Grade 7-9 teachers and 72.2% of Grade 10-12 teachers reported technology skill development workshops as effective or highly effective. Throughout the comments to the open ended questions, there were approximately 6 positive references made to this type of professional development. They included the call for workshops in specific areas such as multimedia, spreadsheets, MsWord, Excel, Power Point, digital photography, SMART boards, electronic report cards, and digital video. In addition, there were 22 specific references to the need to develop skills in web page development.

In the area of classroom observations as a form of technology professional development, 40.6% of respondents selected not applicable. Of those respondents who had participated in classroom observations 65.8% reported effective or highly effective professional development and 6.3% felt that the use of classroom observations had been ineffective or highly ineffective professional development.

Almost 32% of all respondents selected not applicable for Telecollaborative Projects as a form of technology professional development. By omitting the respondents who chose not applicable, 61.1% of those who had participated in telecollaborative projects found it to be effective or highly effective form of technology professional development. In the comment section of the survey, respondents mentioned a need to develop skills in the area of telecollaborative projects 12 times.

Twenty two percent of all respondents selected not applicable for Youth Initiative Program as a form of technology professional development. Of the respondents who had utilized the youth initiative workers, 65.8% of those who had used the Youth Initiative Workers found it to be effective or highly effective form of technology professional development and 7.7% found them to be ineffective or highly ineffective.

The TELUS Learning Connection (TLC) Teacher Leaders were rated as delivering effective or highly effective professional development by 60.4% of all respondents. Only 8.2% reported not applicable, which is testament to the comprehensiveness of this initiative. Of those who had utilized the TLC Teacher Leaders, only 17.1% felt that the use of TLC Teacher Leaders had facilitated ineffective or highly ineffective professional development. In comparing division levels, 66.7% of Kindergarten teachers, 69.5% of Grade 1-3 teachers, 74.8% of Grade 4-6 teachers, 57.1% of Grade 7-9 teachers and 43.8% of Grade 10-12 reported the use of TLC Teacher Leaders as being effective or highly effective professional development.

Teachers' use of a School Based Teacher Guide was reported as effective or highly effective professional development for 60.1% of respondents who had utilized them. Only 15.9% felt that the use of School Based Teacher Guide had been ineffective

or highly ineffective professional development. Overall, 15.7% of all respondents had not used their school based Teacher Guide for technology professional development.

In the comments section of the survey, there were over 40 comments relating to increasing time and access for human resources and leadership in the area of technology professional development. For the most part, respondents felt that Youth Workers, Teacher Guides and TLC Teacher Leaders were doing a good job, but there were just not enough of them to go around. School based Teacher Guides and TLC Teacher Leaders often have full time teaching responsibilities and one respondent noted that "the tech person in our school is often run off her feet helping others and takes away from their teaching time." Another respondent said, "Our present Teacher guide is also our Librarian and has an exhausting schedule meeting the needs of K-9." Numerous respondents commented on the importance of having someone in the school with technical and curricular expertise to be available to mentor or help others with technology integration. Many teachers expressed frustration with their own abilities to solve technical problems and called for increased technical support. Some called for the full time placement of an experienced person in the computer lab to assist with curricular and technical concerns.

Eighty two percent of all respondents reported participating in grade level and subject area meetings. Effectiveness seemed to vary somewhat based on division level. Over half, or 56.3% of Grade 1-3 teachers, 69.7% of Grade 4-6 teachers, 52.1% of Grade 7-9 teachers and 46.6% of Grade 10-12 reported grade level and subject area meetings as being effective or highly effective professional development. In addition, 83.4% of Kindergarten teachers reported grade level and subject area meetings as being effective or

highly effective. This figure, however, needs to be viewed with caution since there were only 6 respondents in the Kindergarten category. On the other end of the scale,18.8% of Grade 1-3 teachers, 12.1% of Grade 4-6 teachers, 13% of Grade 7-9 teachers and 20% of Grade 10-12 reported grade level and subject area meetings as being ineffective or highly ineffective professional development. No Kindergarten teachers felt that grade level and subject area meetings were ineffective or highly ineffective. Respondents asked that grade level and subject area meetings resume 23 times in the comment section of the survey.

Fifty six percent of respondents who reported participation felt that books, journals and other print resources about educational technology were effective or highly effective. Books, journals and other print resources about educational technology were reported as being ineffective or highly ineffective 15% of the time. High school teachers reported books, journals and other print resources about educational technology as effective or highly effective 78.5% of the time.

The use of a Technology Coordinator was reported as effective or highly effective professional development by 54.4% of respondents. It appears that all but 11.9% of respondents had utilized this resource. Since this position was last in effect during the 1999 school year, some of the respondents reporting not applicable may not have been employed by the school district at during that time (for example newer teachers).

The bar charts in Figure 8 summarize the findings for technology professional development that was rated as effective.

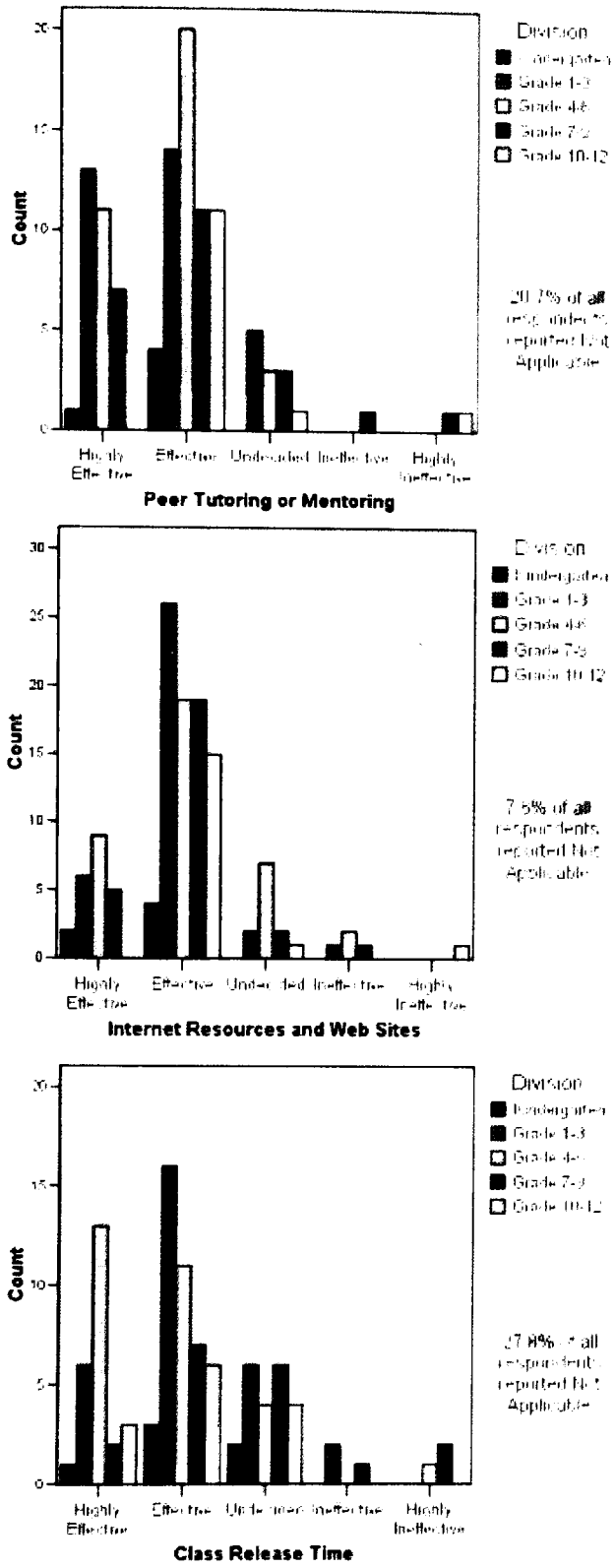


Figure 8. Bar charts for effective technology professional development by division level

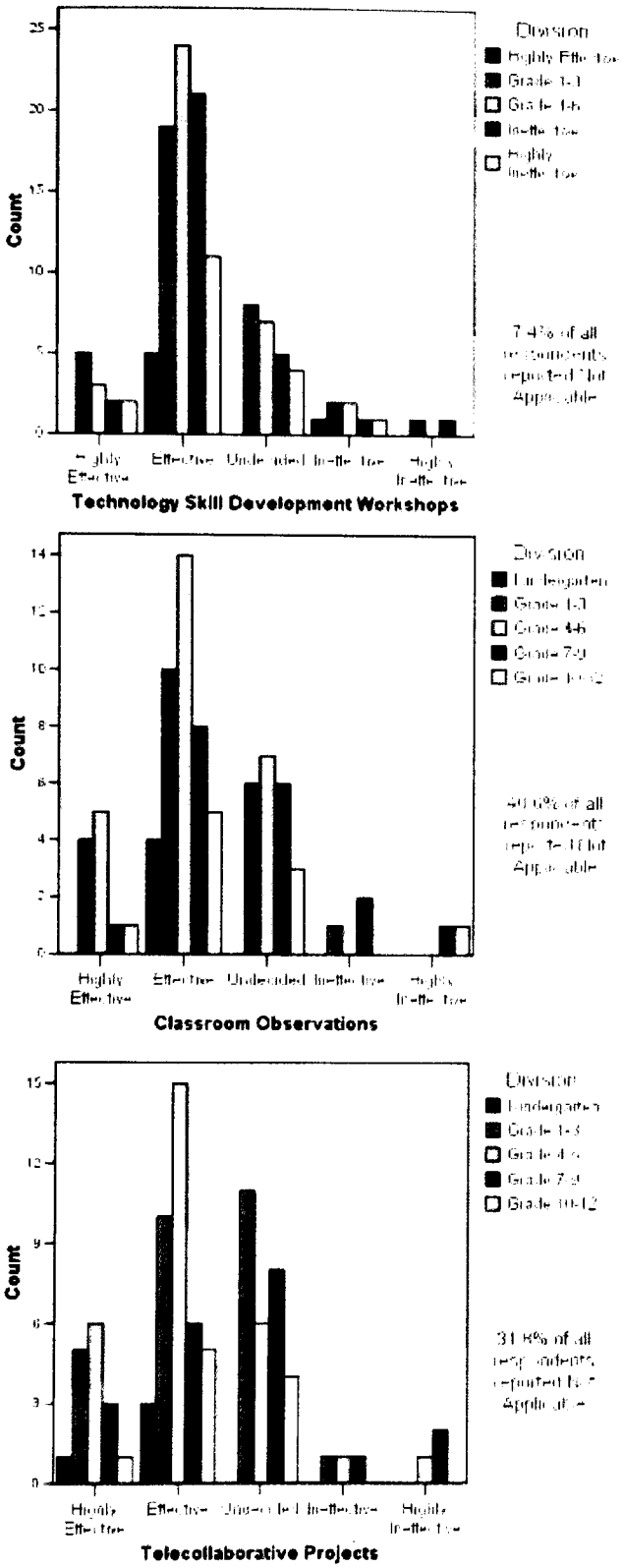
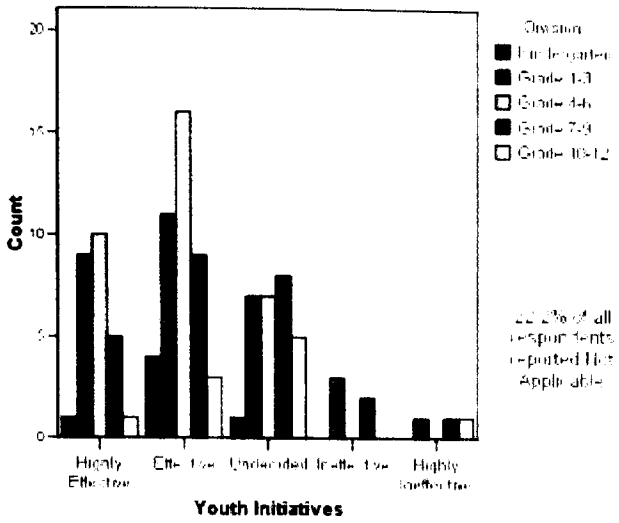
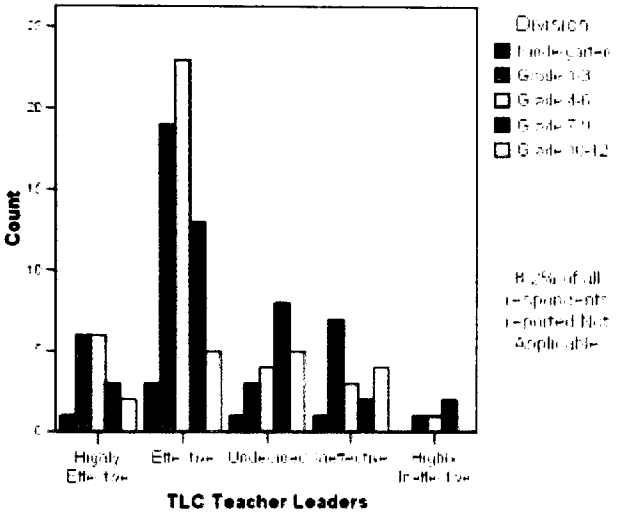


Figure 8 (continued). Bar charts for effective technology professional development by division level





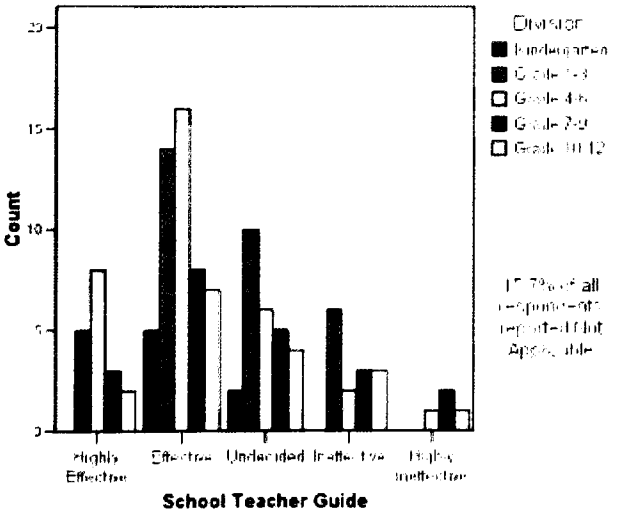


Figure 8 (continued). Bar charts for effective technology professional development by division level

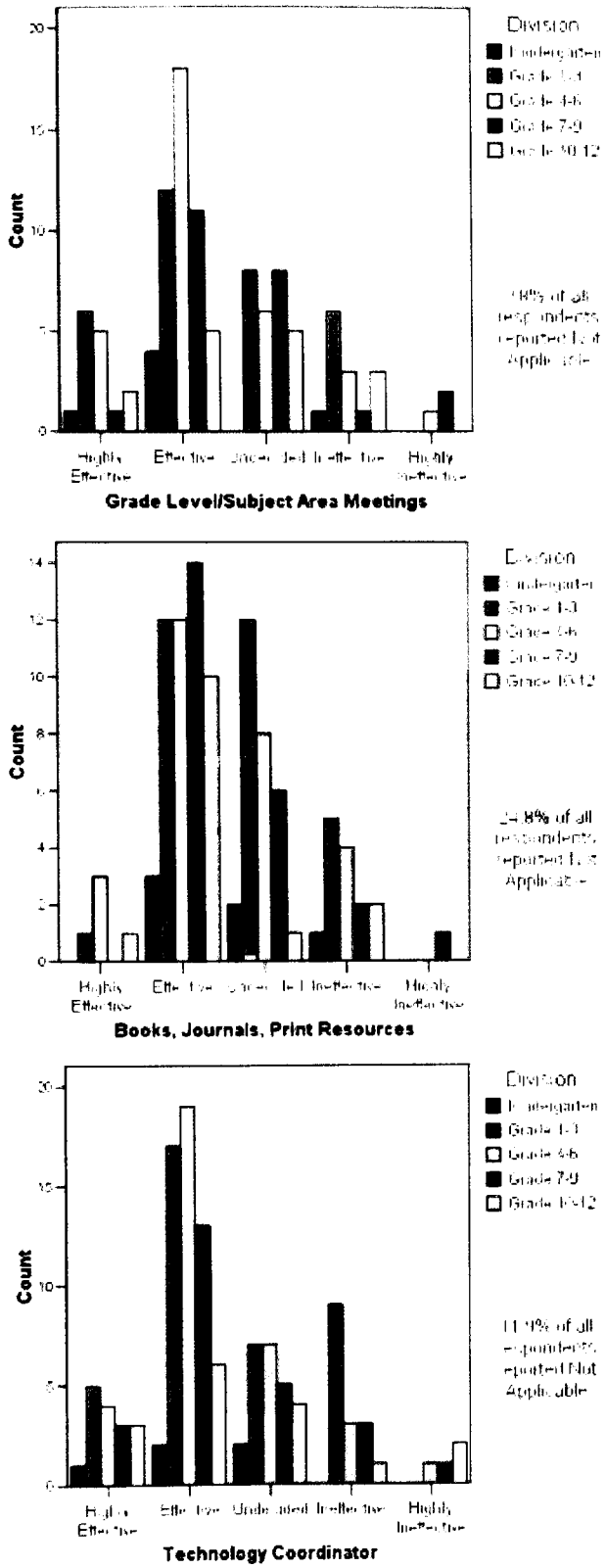


Figure 8 (continued). Bar charts for effective technology professional development by division level

"Unpopular" forms of technology professional development. Technology focused courses, technology focused conferences, online courses, online tutorials and participation in e-mail groups and listserves all had participation rates of less than 55%. Forty five percent of all respondents had participated in technology focused courses, 43.8% for technology focused conferences, 41.5% for online courses, 54.5% for online tutorials and 50.4% for participation in e-mail groups or listserves. For respondents who reported participation in these types of professional development, 61% reported technology focused courses as being effective or highly effective, 67.2% reported technology focused conferences as being effective or highly effective, 53.4% reported as online courses as being effective or highly effective, 53.4% reported online tutorials as being effective or highly effective and 43.3% reported e-mail groups or listserves as being effective or highly effective. Respondents reporting participation in these types of professional development chose ineffective or highly ineffective 6.8% of the time for technology focused courses, 6.3% for technology focused conferences, 12.3% for online courses, 12.3% for online tutorials and 14.9% for email groups and listserves. Almost 42% of respondents participating in e-mail groups and listserves were undecided about their effectiveness. It appears that, for the most part, teachers who participate in these types of professional development find them useful, but over half of the respondents in this study have chosen not to engage in technology focused courses, technology focused conferences, online courses, e-mail groups or listserves. Figure 9 shows the distribution by division level for each of the five professional development types that fall into the unpopular category.

In the comments section of the survey, there were 5 positive references to online courses, and technology focused courses. These respondents will likely pursue these avenues individually without the assistance of school based support.

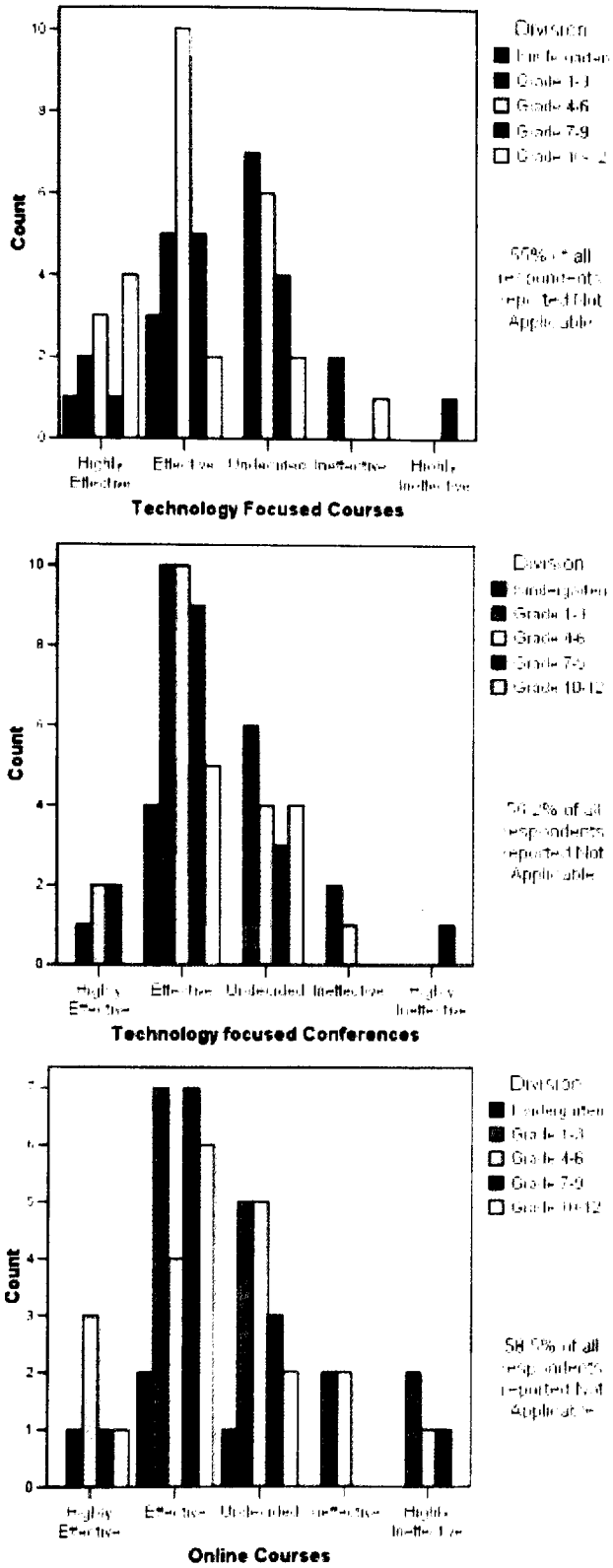


Figure 9. Bar charts for high "unpopular" technology professional development by division level

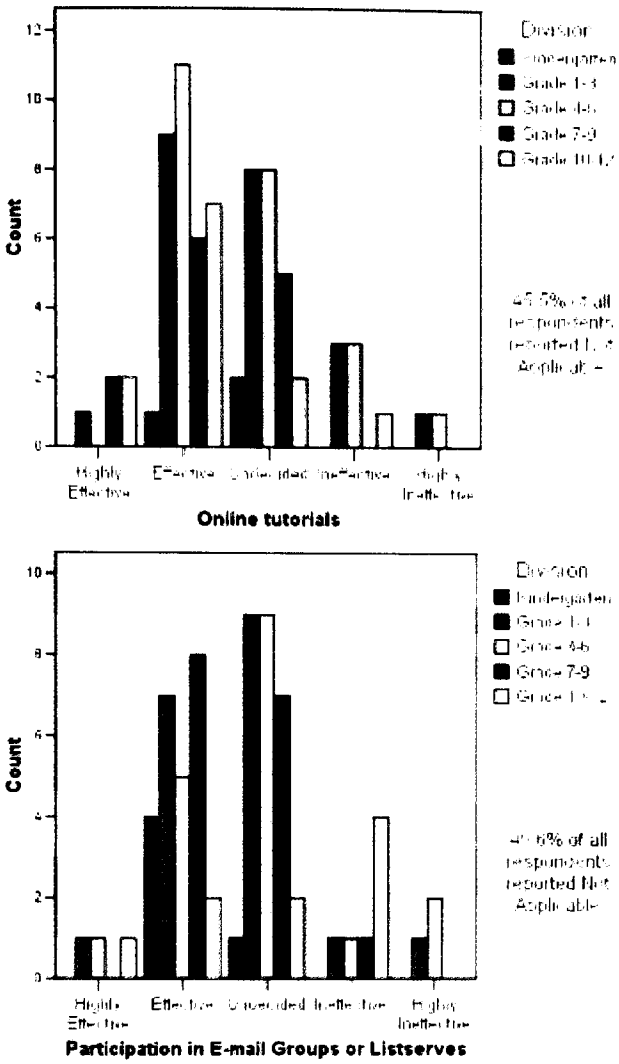


Figure 9 (continued). Bar charts for high "unpopular" technology professional development by division level

"Least favored" technology professional development. While no respondents felt that one shot workshops were highly effective, 46.4% of those reporting participation felt that they were effective. 33.6% were undecided and 20% felt that one shot workshops were ineffective or highly ineffective. Interestingly, 50% of Grade 7-9 teachers were undecided about the effectiveness of One Shot Workshops. Figure 10 shows the distribution by division level for one shot workshops.

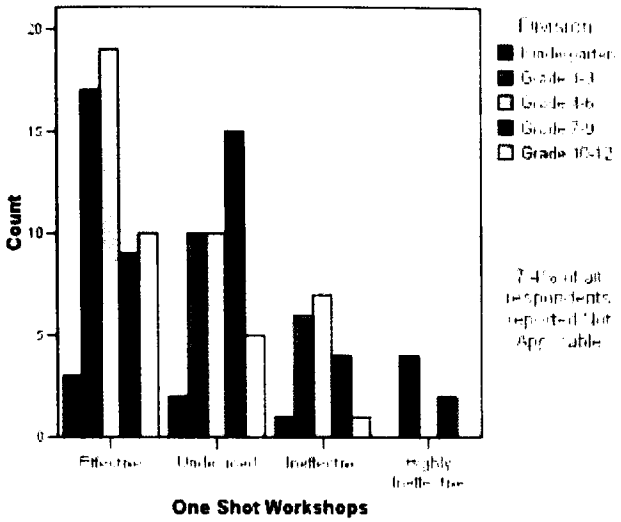


Figure 10. Bar chart for least favored technology professional development by division level

Chapter 5: Discussion

Based on the survey findings, some trends emerge in relation to technology professional development needs and barriers. This section will examine the needs and barriers as well as some suggestions for addressing them.

Technology Professional Development Needs

Class Release Time. As has been previously discussed, about half of respondents reported class release time as effective or highly effective professional development. In addition, class release time was mentioned 34 times in the survey comments as a need. Some schools in the district have managed to find ways to provide class release time to teachers through creative timetabling, scheduling and budgeting. At one school, the Teacher Guide is provided with a substitute teacher for at least two days per month. The Teacher Guide has chosen to hire two substitute teachers on the same day to free up themselves and another teacher. One substitute teacher covers the Teacher Guides' classroom, while the second substitute teacher is scheduled to cover other teachers for specified periods during the school day. At some schools, teachers regularly hire substitute teachers to cover their classes using telecollaborative project funding to cover the costs. This enables groups of two, three and four teachers to work together for part or all of the day. Often these days revolve around mutual sharing and development of skills and pedagogy involved in telecollaborative learning.

Hiring substitute teachers is not always the best alternative for providing release time for professional development. Planning for a substitute teacher is very time consuming in and of itself and teachers tend to plan different types of student activities for substitute teachers than they would for themselves. For example, most teachers would

choose to introduce new topics and provide class instruction themselves leaving more practice, follow up and skill and drill types of activities for substitute teachers. Although this is not necessarily an ineffective use of student time, it can disrupt the regular flow of teaching and learning.

Integration Strategies. There were 41 comments submitted on the technology survey that showed that teachers want to learn more about how to integrate technology into subject areas. A few teachers called for Alberta Learning to include technology outcomes in the subject area curriculums since it is expected that the ICT Outcomes be infused in the subject areas. The purchase of hardware and software needed to integrate technology into teaching and learning is a huge financial cost to schools and there needs to be a good reason to justify the expenditure.

Teachers need to realize that teaching with technology not only enables, but also requires changes in traditional teaching practice. (Alberta Learning, 1999; Byrom, 1998; Carvin, 1999; Corcoran, 1995; Lieberman, 1996; Peck, Cuban & Kirkpatrick, 2002 and Serim, 1996.) For example, it is not reasonable to expect that you can take a class of 25 – 30 students to a computer lab and have them all go to the same web site and complete the same online activity at the same time. A more valuable use of the resource would be to differentiate instruction through having different students access different web sites, perhaps on the same topic, (or better yet, student-selected topics) and then use the technological tools available to share and present their findings in creative and innovative ways.

Although teachers still feel the need to have technology workshops geared to the operation of specific software (web page development, for example), over 40 teachers are

asking to learn new technologies in the context of optimal use with students. The grade level and subject area meetings are geared to provide professional development activities that encourage collaboration and sharing among teachers with similar teaching assignments Since the grade level and subject area meetings were held in 5 half day sessions over a 3 year period, in many cases, teachers were able to form lasting relationships with others that could be classified as *teacher collaboratives* (Grant, n.d.), *teacher networks* (Corcoran, 1995; Lieberman, 1996; and Rodriguez, 2000) *or professional learning communities* (DuFour, 2004).

Teachers expressed interest in learning more about how to plan and implement telecollaborative projects at least 12 times in the survey comments. Telecollaborative project work has enhanced technology integration in Holy Spirit Schools on a number of different levels over the past 6 years. Teachers involved in telecollaboration have enhanced their own learning as noted earlier in Harris and Grandgenett's (2002) study of unexpected teacher learning outcomes. Telecollaboration lends itself well to more subject-integrated, student-centered, constructivist modes of teaching and learning. Teachers have also continued to form and sustain online learning communities by working with other teachers and students in the online environment. This researcher is aware of numerous instances of teachers working together who did not meet face to face until after significant online collaboration. The TELUS Learning Connection has also provided a financial incentive for teachers initiating telecollaborative projects. Rodriguez (2000) affirms the importance of providing incentives for teachers to utilize technology. Many teachers in Holy Spirit Schools, have used telecollaborative project funding to enhance their skills and resources with technology. Most importantly, students have

benefited from participation in telecollaborative learning. Students have been given the opportunity to use technology as a tool to enhance learning in subject areas.

Human Resources. The final area which teachers expressed a definite need was the area of human resources. At least 45 times, teachers expressed the need for increased time and availability of their school based Teacher Guide, the TLC Teacher Leaders, Youth Workers, a District Technology Coordinator and technical support. Byrom (1998) found that "there seems to be a correlation between the amount and level of technical assistance ... provide[d] and movement along the continuum of technology integration." (3rd Lesson section, para. 1) In Holy Spirit Schools, the level of support for the integration of technology is mainly a school-based decision. District-level support has been downsized with the elimination of the position of District Technology Coordinator in 2001 and the gradual decrease in school-pooled funds for the TLC Teacher Leaders. The shift has been towards developing and sustaining school-based technology leadership through the Teacher Guides. Schools have supported the role of the Teacher Guide to different degrees, each reflective of the unique needs of the overall school culture and student population. Teachers comments included, "Ensure that [Teacher Guides] have time and $ to do the job effectively," "provide more support in numbers of people. Have people available to support other teachers and classes. Have full time technology people in each school," "you need people in each school that can be teachers/mentors to each other," and "having someone with expertise in the school that I can talk to when I need help or a question."

Teachers' comments also expressed support for the Youth Workers. Financially, Youth Workers are a good investment because they bring to the school expertise in

trouble shooting technical problems as well as a varied background in different software packages at a minimal financial cost. They can meet the technical needs of beginner to advanced teacher expertise. The main drawback of hiring Youth Workers is that they are not teachers with background in curriculum or pedagogy. As has been previously stated, teachers are asking for more than just technology skill development alone. This needs to be balanced with pedagogical best practices in technology integration.

Technical support is one of the most frustrating issues for teachers. Peck et al. (2002) report that one of the reasons technology is not being incorporated extensively in classrooms is defects in technologies, such as computer freeze ups and crashes that cause teachers to resort to backup plans. Holy Spirit teachers identified frustrations with availability of technical support with comments such as, "We need more people to be able to be here when we need them to help us through trouble shooting and showing us new programs," "computers freeze and not having tech support in the computer room to help work with students," "teachers do not know how to fix computer problems…they just want the technology to work when they need it." "We need to invest in more personnel whose job it is to be on site, maintaining, upgrading and mentoring about computers," and "the biggest problem I have to deal with is too many snags and malfunctions in the computer lab, with the server [and] my classroom computer." Byrom (1998) sums up these comments by stating that "teachers need on-site and on-demand technical assistance with both the technology and the integration of technology into teaching and learning." (6th Lesson section, para. 1)

Barriers to Integrating Technology Outcomes into Curricular Areas

Time. Time was mentioned as a barrier to the integration of ICT outcomes at least 80 times in the survey comments. This is especially true with professional development in the area of technology. At least 12 respondents commented on the rapidly ever-changing field of technology. Just when we think we might have begun to master a software program or new piece of hardware, a new and better innovation is introduced. It becomes easier and quicker to learn each subsequent innovation, but it is still time consuming. It can be stressful in and of itself just trying to stay knowledgeable about what new innovations are being developed and then entering into the decision making process as to whether this is something that needs to be considered and purchased for school use. In the *Findings and Analysis* section, it was discovered that only 12.7% of teachers overall have incorporated technology for student planning. Teachers are not encouraging their students to use mind mapping, organizational, webbing, flow charting and outlining software. Although this type of learning holds great promise for improving higher order student learning, many teachers are likely not familiar with it and do not have access to it in their schools. Searching out useful relevant websites also requires a large investment of time and teachers find that the Internet is also ever changing. Last year's best web resource might not continue to be available, or there may be a user fee attached and more interesting and interactive web sites are being posted each day. (Peck, et al., 2002)

Access to technology. A second barrier to integration of ICT outcomes is student access to technology. This was mentioned 34 times in the survey comments and in almost all cases came from Division III and Division IV teachers. The problem expressed is that

subject area teachers are expected to integrate technology but the computer lab is booked solid with technology options classes. A teacher who teaches high school Language Arts all day is not able to book a computer lab all day every day or even all day any day. This makes integration of computer technology outcomes very challenging. The greatest barrier in teachers' own words, "is sharing resources, rooms, and again, time allotment to set up, teach and allow the students to experience the technology fully on their own," "not enough lab time," "access to computer when you need it," and "sharing the computer lab with the rest of the school." The issue of sharing a computer lab with the whole school brings to mind the importance of creative and critical thinking to utilize the tools that innovative technologies have to offer. Schools in southern Alberta are beginning to experiment with alternatives to the computer lab, with technologies such as Personal Digital Assistants (PDAs), mobile laptop labs, wireless networking, SMART boards and / or projectors in every classroom. Students in the Holy Spirit school district are just beginning to bring their own laptops to school. The next obstacle then becomes security issues in allowing them access to the network and the Internet at school. Peck et al, (2002), point out that "two traditional school structures – separate subject departments and cellular classroom arrangements – work in tandem to forestall teachers' use of technology." (Why so little impact section, para. 3) This might be a key to understanding why the frustration of access to the lab becomes more apparent in Grade 7 – 12 than it is in Kindergarten to Grade 3 where teachers, who teach numerous subjects to a home room class can be more flexible in planning project work which integrates subject areas.

Evergreening of technology. In the Holy Spirit Technology survey, frustrations with outdated technologies were noted 33 times. One teacher even went so far as to say,

"Don't waste my time with more workshops until the technology in the schools matches our skills." Grant (n.d.) states that "teachers' mastery is dependent on their having extensive hands-on time with the tools they are learning to use." It is important that teachers have access to computers that are reliable and can perform the tasks required.

Teachers in some schools in particular are outright frustrated with the technology available in their schools. Thirty three comments centered around teachers' dissatisfaction with the technology available in their school. Another twenty four respondents mentioned the high costs of technology. The purchase of technology resources is a school-based decision and in some cases human resources are simply more important than upgrading hardware and software. In Holy Spirit Schools, there is an overall 3.49:1 ratio of students to computers and 6.92:1 ratio of students to modern computers. Some schools, mainly due to financial constraints have very outdated technology resources. Since m*odern* technology in the district includes hardware that is newer than 5 years, each school needs to set aside enough funding every year for ever-greening of technology. Within a 5 year time span, every piece of equipment should be cycled through the system and replaced. In one school, 80% of respondents expressed concern about outdated technology within their school, while 0 to 4 respondents from other schools expressed concern. In that same school, the ratio of students to modern computers is 48.33 : 1 with 61 of the 67 student computers in the school older than 5 years. Teacher comments about barriers to technology integration included, "The fact that most of the computers have problems with them (ex certain software doesn't work or computer will freeze or shut down)," "The greatest barrier is having programs that always work. There is nothing more frustrating than taking a group of 30 students to the

computer lab and having a third of the computers not work on whatever program we are using," and "Our school has useless computers. ex. half dell 566mhz computers and half are 10 year old Compaq 166." Table 5 illustrates the disparity in student to computer ratios for schools in the Holy Spirit District.

The Computers for Schools program has been available to Alberta Schools for a number of years, now. This program enables schools to purchase refurbished used computer equipment at reduced costs. In Holy Spirit School district, technicians have found that trying to install these computers of differing specifications on the school system network causes more problems than benefits. The district has moved to a policy of purchasing computers for the network of a certain quality and speed to enable more consistency in operation of the technology.

In one Holy Spirit School, each teacher has been equipped with a laptop computer. This allows them to load programs at school and then take them home to practice and learn on. Teachers in this school were able to take home the electronic report card program to work on student reports in the evening and on weekends in the comfort of their own homes. "Hands on technology use at school and at home allows teachers to develop confidence in their skills and a comfort level with the technology." (Rodriguez, 2000, Hands on technology use section, para. 2) The issue of funding for sustainability of technology will need to continue to be addressed in this school district and in the province of Alberta in general.

Based on teachers' comments relating to technology professional development needs and barriers to integration, it is clear that we need to continue to work toward the dream of transparency in the use of technology to enhance teaching and learning. Schools

will need to continue to explore creative ways to free up time for teachers to learn together. This learning needs to involve discussions about appropriate pedagogy as well as development of technology skills and it needs to be scheduled at optimal learning times for teachers.

Table 5.

Student to computer ratios by school

School	Total Number of Student Computers	Number of student computers over 5 years old	Student to Computer Ratio	Student to Modern Computer Ratio
School 1	250	173	3.22	10.46
School 2	67	61	4.32	48.33
School 3	93	53	4.43	10.3
School 4	120	25	3.63	4.58
School 5	96	40	2.26	3.87
School 6	47	17	4.19	6.56
School 7	112	49	4.96	8.82
School 8	67	3*hard to tell	3.79	3.96
School 9	92	25	2.66	3.65
School 10	108	73	3.76	11.62
School 11	53	24	3.20	5.86
School 12	81	54	1.71	5.14
School 13	116	47	2.52	4.24
Totals	1302	644	3.49	6.92

Addressing Technology Professional Development Needs.

Integration of technology into classroom practice. At least 40 respondents in the Holy Spirit technology survey commented on the issue of working with colleagues to invent, discover and create ways to effectively integrate technology into curriculum. As noted in the *Findings and Analysis* section, 86% of teachers who had participated in peer tutoring and mentoring found it to be effective or highly effective professional development. Other effective practices related to working with colleagues included class release time, class observations, Youth Initiatives Workers, school based Teacher Guides, TLC Teacher Leaders and a district based Technology Coordinator. Teachers are asking for grade level and subject area meetings for the purpose of learning together. These sessions were not meant to be workshops given or delivered to the participants. These are not *training* sessions. The structure of these meetins has always been to promote collegiality among grade level peers and to "enable teachers to shape their own learning." (Grant, n.d., Principles section, bullet 8) Based on the numerous comments from respondents and support in the literature review, this researcher recommends that the grade level and subject area meetings should be continued. But NOT as *technology meetings.* They need to become *curriculum meetings* under the direction of the District Coordinator of Curriculum. These meetings would then be *curriculum based* and *technology infused*, rather than *technology based.* These meetings need to enable teachers to experience inquiry-based learning environments in order to internalize its aims and carry this into their classroom practice with students. (Grant, n.d.; Serim, 1996) The meetings need to provide structures for teachers to continue to form partnerships,

collaboratives, and mentorship for one another. They need to be conducted in such a way as to model exemplary teaching practice.

School based leadership. Over the past few years, the focus in the Holy Spirit School District has shifted to working more intensely with school based Teacher Guides to help develop leadership within each school. Human interaction was the underlying theme of effectiveness in the survey results with 4 out of 6 of the most highly rated forms of professional development involving direct human contact. Teachers said over and over again in their survey comments that they needed more readily available help at the school level. Teacher Guides have been welcomed and appreciated by teachers, but in order to keep moving forward, schools will need to support the Teacher Guide structure through providing release time for Teacher Guides and teachers to work together, preparation time for the Teacher Guides and support for more than just one individual in each school to assume the role. We risk burn out of our valuable Teacher Guide as a resource if adequate supports are not put in place. School based Teacher Guides are school leaders and are very likely to move on to other leadership roles, such as associate principals and principals as opportunities become available. The district needs to plan for sustainability of school based leadership through supporting more than just one technology leader in each school.

School district leadership. Leadership in technology at the school district level needs to continue. Many teachers would like to see the return of the position of a Technology Coordinator. If there is to be consistency across the district in teacher technical competence, technology integration and adequacy of hardware and software, there needs to be more district level leadership. All of the people who currently provided

leadership are doing so above their existing workload. A district Technology Coordinator could help ensure levels of implementation through dedication to staying abreast of new developments in the field of educational technology, networking with other district leaders in the province and around the world and assisting with important decision making. Lack of funding has made this a bleak possibility.

In the absence of a district Technology Coordinator, district leadership needs to continue through the district technology committee, the TELUS Learning Connection Teacher Leaders and the school based Teacher Guides with the support of Central Office and Principals. School based support needs to be seriously considered in the selection of potentially effective Teacher Guides, Youth Technology Support Workers and new staff who are interested and knowledgeable in technology. The Holy Spirit Technology Survey 2004 demonstrates that teachers are demanding on-site human technical and pedagogical support for the integration of ICT Outcomes. Another alternative to improving human support for technology in schools could be achieved by forming partnerships between schools. High school students could perform work experience in elementary schools to assist in the area of technology.

Variety of technology professional development opportunities. Teachers continue to call for a variety of options for technology professional development. The box plot in Figure 7 clearly illustrates that teachers support a variety of technology professional development activities. We need to remember that teachers as learners have diverse learning styles and needs just as our students do. Professional development in the area of technology needs to be ongoing and responsive to the needs of teachers. Fullan (2001) reminds us that change is a process that can take a substantial amount of time. Grant,

(n.d.) refers to this as the long haul of change. Teachers want technology skill development workshops at their own skill level. Of the teachers who had participated in technology skill development workshops, 75.6% felt that they were effective or highly effective. The main concern about this form of professional development expressed in the comments was that this type of learning should be geared to specific skill levels. Teachers do not want workshops that go too slow while the leader helps beginners or so quickly that they get lost. The *Findings* also provide some support for increasing teachers' technical competence. The more ways a teacher could use technology was moderately positively related to the number of ways they had their students use technology for learning. As teachers develop a broader knowledge base about ways to use technology, they can begin to incorporate more variety into their teaching. In Language Arts for example teachers can expect much more than simply word processing from their students. The processes of planning, researching, organizing information, composing, and publishing could all include different types of softwares.

Some teachers are eager to use the tools that technology has to offer through online courses and tutorials, web based learning, becoming involved in professional development through videoconferencing, and telecollaborating with others around the world. Although less than 55% of teachers had engaged in formal Internet learning opportunities, those who had used these types of learning felt that they were effective. In addition, use of the Internet for informal professional learning was rated as effective or highly effective by 86% of respondents who had used this resource for technology professional development. This is a strength that the district can build on in planning future professional activities. With the onset of Supernet and advances in

videoconferencing, teachers could tap into tremendous new and interactive forms of professional development, using technology as the tool to support their learning possibilities. This, in turn can be extended to classroom practices, where students can actualize the dream of the global classroom. Serim (1996), dreams of teachers who embrace the concept of lifelong learning and utilize the tools of technology to develop professionally. Through a combination of online and face to face collaboration with like-minded professionals, teachers could experience that which they hope to provide for our students. Membership in professional communities could help teachers to: "(a) stay connected to the most current knowledge in education, (b) engage in reflective dialogue with other educators, (c) provide and receive emotional support, and (d) contribute to what counts as knowledge in their field." (NCREL, 2004, Role of technology section, 4th bullet) Technology offers us many new and different ways to learn and we are only just beginning to tap into the possibilities.

We have seen through the literature that teachers are motivated to participate in professional learning when they can see that their efforts will be rewarded with improved student learning. (Guskey, 2003) Many teachers are still waiting to see evidence of improvement in student outcomes before they will fully commit to utilizing technology for student learning. One respondent stated, "I need to see the practicality and overwhelming betterment of my teaching in using a specific process before I invest a huge amount of time learning it and refining it so that it is useable." This researcher sees the answer as two fold. First, we must begin to document, measure and record changes in student learning due to the use of educational technology. Secondly, we need to help teachers understand that it is not technology in and of itself that will enable student

improvement. The pedagogical shifts discussed throughout this document are key to making changes and reaping the benefits that are available to us.

Chapter 6: Conclusions

Holy Spirit teachers have been involved in a wide variety of technology professional development experiences over the past six years. Early on professional development in the area of technology seemed to focus primarily on developing skills in technology. Over time, the district has evolved to the point where teachers want to discuss more pedagogical types of issues involved in incorporating technology. This is not to say that there isn't a place for skill development workshops. Teachers still express desire to develop a base knowledge of technological skills in order to be able to see possibilities for improvement of teaching and learning with technology. However, the district is moving beyond the old training paradigm towards extending "a vision of technology as an empowering tool for teachers and students." (Grant, n.d., Principles section, bullet 1) Technology, then is not an end in itself, it is a tool that we use as reflective educators in attempting to improve teaching and learning.

The purpose of this study was to identify effective technology professional development practices and to provide direction for future professional development in the Holy Spirit School Division as it relates to integration of ICT Outcomes. Five recommendations have emerged based on the findings.

Technology professional development needs to create and support opportunities for collaboration with colleagues. All of the professional development types that included human interaction were highly rated by respondents in the survey. One of the most highly supported forms of interaction was the peer tutoring and mentoring. Teachers are asking for professional development structures that support peer interaction. The first recommendation is to continue grade level and subject area meetings as *technology*

infused curriculum meetings that allow teachers with similar teaching assignments to explore areas of common concern.

The second recommendation is that the district and individual schools continue to develop and support District and school based leadership. This needs to be supported through release time at the school level for Teacher Guides and teachers to work together. Schools could benefit from having more than on Teacher Guide. Stronger District direction could be achieved through the leadership of a district Technology Coordinator.

Thirdly, a variety of technology professional development opportunities need to be offered. Teachers need and want to develop skills in both pedagogy and technology skill development. Of the 18 different types of technology professional development explored in this study, 12 were found to be effective. Another 5 types were found to be effective by the 45% or fewer respondents who had used them. Not surprisingly, the only type of technology professional development not favored by teachers was one shot workshops.

Schools and the district must continue to budget effectively for evergreening of technology. This could be enhanced through district budgeting rather than school based decision making. The school district needs to be diligent in continuing to lobby the province to provide financial support for the integration and maintenance of current technologies in schools.

Finally, we need to focus technology integration on the improvement of student learning through measurable and observable improvements in student learning. If we are to continue to garner support for technology in schools, the costs in teacher time and effort and the schools' financial burden need to be offset by proven benefits to students.

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Appendix A

Teachers and Teaching Administration Survey on Technology and Needs

The purpose of this survey is to assess the effectiveness of various types of professional development in empowering teachers to integrate Information and Communication Technologies (ICT) outcomes into the curriculum in meaningful ways. It is being conducted as part of the 3-year Technology Plan for Holy Spirit Schools in conjunction with a Masters level Project for the University of Lethbridge.

Data will be reported in the Masters of Education final project report on a school-by-school basis as well as a division wide analysis. In this report, each school will be identified only by a letter and not by name. This document will be available through the University of Lethbridge Library and the Catholic Education Center.
In addition, each school principal will receive their own school analysis along with the school division analysis. Senior administrators at the Catholic Education Center and the primary researcher will have access to the data with school names but not individual respondents identified. The researcher will likely publish and present the outcomes of this project at professional conferences and workshops. Schools and individuals will remain anonymous to the general public.

In keeping with the Freedom of Information and Protection of Privacy Act (FOIP), the utmost care and attention will be given to privacy and confidentiality issues. All names will be removed from the data. All responses will be dealt with in confidentiality and used only to garner trends or group responses. Original data will be kept in locked storage by the primary researcher for a period of five years. At such time, it will be destroyed.

By completing this survey, you are giving your consent to participate in the research described above.

If you have any questions, please contact the primary researcher (see below).
Access to the final project report can be obtained through the University of Lethbridge Library, the Catholic Education Center or direct contact with the primary researcher.

If you have any general questions about the project, you can contact my Faculty Advisor, Marlo Steed, Faculty of Education (e-mail marlo.steed@uleth.ca, phone (403) 329-2189), or Thelma Gunn, Chair, Faculty of Education Human Subjects Research Committee (e-mail thelma.gunn@uleth.ca, phone (403) 329-2455). Thank you for your help.

Primary Researcher:
Lorelie Lenaour
lorelie.lenaour@holyspirit.ab.ca
St. Paul School
403-328-0611

1. What grade level do you represent?
   - ☐ K- Grade 3
   - ☐ Grade 4-6
   - ☐ Grade 7-9
   - ☐ Grade 10-12

2. What school do you teach at?
   - ☐ Catholic Central High School
   - ☐ Children of St. Martha School
   - ☐ Ecole St. Mary School
   - ☐ Father Leonard Van Tighem School
   - ☐ Our Lady of the Assumption School
   - ☐ St. Catherine School
   - ☐ St. Francis School
   - ☐ St. Joseph School
   - ☐ St. Mary School, Taber
   - ☐ St. Patrick Fine Arts Elementary School
   - ☐ St Patrick School, Taber
   - ☐ St. Paul School

3. My own home computer is
   - ☐ newer than 2 years
   - ☐ 2-5 years old
   - ☐ older than 5 years
   - ☐ I don't own a home computer

4. Do you have access to the Internet at home?
   - ☐ Yes
   - ☐ No

5. How long have you been using computers?
   - ☐ 0-1 year
   - ☐ 1-3 years
   - ☐ 3-6 years
   - ☐ More than 6 years

6. Rank your personal skill level regarding computer technology.
   - ☐ no interest
   - ☐ just beginning
   - ☐ intermediate
   - ☐ above average
   - ☐ expert

7. How many minutes per week on average do you use a computer at school?

0 hours 1 hour 2 hours 3 hours 4 hours
5 hours 6 hours 7 hours 8 hours 9 hours
10 hours More than 10 hours

8. How many hours per week on average do you use a computer at home? Work related

0 hours 1 hour 2 hours 3 hours 4 hours
5 hours 6 hours 7 hours 8 hours 9 hours
10 hours More than 10 hours

Personal use

0 hours 1 hour 2 hours 3 hours 4 hours
5 hours 6 hours 7 hours 8 hours 9 hours
10 hours More than 10 hours

9. I use computer technology for

- ☐ class preparation using productivity tools (word processing, graphs)
- ☐ record keeping (e.g. grades/marks, report cards)
- ☐ instruction for in-class demonstrations
- ☐ newsletters, memos, letters
- ☐ professional e-mail, chat groups, listserves
- ☐ producing class web pages (posting web based calendars and assignments)
- ☐ production of multimedia (power point, digital video, slide show presentations)
- ☐ production of graphics or art
- ☐ Internet research
- ☐ locating web sites that match a particular curriculum goal
- ☐ digital photography
- ☐ digital video
- ☐ other _____

10. Is professional development in the area of technology part of your personal professional development plan?

- ☐ Yes
- ☐ No

11. I have **students** using computers in class for

- ☐ publishing/word processing
- ☐ data gathering and analysis (spreadsheet / database applications)
- ☐ computer assisted learning (learn from software that teaches academic content, review, practice, reinforce basic skills)
- ☐ e-mail use
- ☐ Internet use
- ☐ drawing and painting
- ☐ planning (e.g. mental mapping, organization, webbing, flowcharting, outlining)

- ☐ presentation software (e.g. Power point, Hyper studio)
- ☐ information gathering/ resources (e.g. CD-ROM Encyclopedia) drafting (CAD)
- ☐ keyboarding/typing
- ☐ telecollaborative projects
- ☐ creating web pages – (producing work for online sharing)
- ☐ reward (games)
- ☐ other – please specify

_____

12. Do you teach ICT Outcomes as a separate stand-alone class?
    - ☐ Yes
    - ☐ No

13. On average, how many **minutes** per week do you have students using computers in class? (Select N/A if you do not teach the subject)

Language Arts
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Math
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Science
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Social Studies
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Religion
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

French
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Biology
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Chemistry
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Physics
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Art
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Music
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Drama
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Physical Education
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

Integrated Subject lessons
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

14. How many minutes per week do you require students to use computers outside of class time?
N/A none 0-30 minutes 30-60 minutes 60-120 minutes
120-180 minutes 180-240 minutes more than 240 minutes

15. How do you assess student achievement of the ICT Outcomes?

☐ Assessment of ICT Outcomes as stand-alone skills
☐ Assessment of ICT Outcomes as part of subject area assignments
☐ I do not assess student achievement of ICT Outcomes
☐ Other:

_____

Effective Professional Development in Technology should help you to become familiar and skilled in using and integrating technology into the curriculum.

Please consider "effectiveness" to include:

- Appropriateness in content and applicability
- Relevance to your teaching assignment and the ICT Curriculum
- Sustainability of learning

Rate the effectiveness of **your experiences** with Professional Development in Technology

	5 Highly Effective	4 Effective	3 Undecided	2 Ineffective	1 Highly Ineffective	0 Not Applicable
Technology skill development workshops (i.e. a class on operating MS Word, Excel, Power Point…)						
One shot workshops						
Technology focused courses, institutes (i.e. summer institutes, semester courses)						
Technology focused conferences						
Online courses						
Online tutorials						
Participation in e-mail groups or listserves						
Books, journals and other print resources about educational technology						
Internet resources and websites						
School district based support through district technology coordinator (1999 school year)						
School district based support through TELUS Learning Connection Teacher Leaders						
School district based support through grade level / subject area meetings						
School based support through technology Teacher Guide						
School based support through classroom release time						
Participation in telecollaborative projects						
"Youth Initiatives" Student Workers						
Peer tutoring or mentoring						
Observing other classrooms						
Other – Please specify						

What has been the most effective technology professional development you have participated in? In what ways did it meet your specific needs?

What are your greatest needs with respect to technology professional development?

What are the greatest barriers to your use of technology with your students?

What technology professional development would you like to participate in over the next three years? (You may wish to refer to the checklist on previous page)

What suggestions do you have for how the school district might better support teachers in integrating technology?

Appendix B

Crosstabulation tables for different types of Technology Professional Development

Technology Skill Development Workshops * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	0	5	3	2	2	12
	% within Division	.0%	14.3%	8.3%	6.7%	11.1%	9.6%
Effective	Count	5	19	24	21	11	80
	% within Division	83.3%	54.3%	66.7%	70.0%	61.1%	64.0%
Undecided	Count	0	8	7	5	4	24
	% within Division	.0%	22.9%	19.4%	16.7%	22.2%	19.2%
Ineffective	Count	1	2	2	1	1	7
	% within Division	16.7%	5.7%	5.6%	3.3%	5.6%	5.6%
Highly Ineffective	Count	0	1	0	1	0	2
	% within Division	.0%	2.9%	.0%	3.3%	.0%	1.6%
Total	Count	6	35	36	30	18	125
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* 7.4% of all respondents selected Not Applicable

One Shot Workshops * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	0	0	0	0	0	0
	% within Division	0%	0%	0%	0%	0%	0%
Effective	Count	3	17	19	9	10	58
	% within Division	50.0%	45.9%	52.8%	30.0%	62.5%	46.4%
Undecided	Count	2	10	10	15	5	42
	% within Division	33.3%	27.0%	27.8%	50.0%	31.3%	33.6%
Ineffective	Count	1	6	7	4	1	19
	% within Division	16.7%	16.2%	19.4%	13.3%	6.3%	15.2%
Highly Ineffective	Count	0	4	0	2	0	6
	% within Division	.0%	10.8%	.0%	6.7%	.0%	4.8%
Total	Count	6	37	36	30	16	125
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* 7.4% of all respondents selected Not Applicable

Technology Focused Courses * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	1	2	3	1	4	11
	% within Division	25.0%	12.5%	15.8%	9.1%	44.4%	18.6%
Effective	Count	3	5	10	5	2	25
	% within Division	75.0%	31.3%	52.6%	45.5%	22.2%	42.4%
Undecided	Count	0	7	6	4	2	19
	% within Division	.0%	43.8%	31.6%	36.4%	22.2%	32.2%
Ineffective	Count	0	2	0	0	1	3
	% within Division	.0%	12.5%	.0%	.0%	11.1%	5.1%
Highly Ineffective	Count	0	0	0	1	0	1
	% within Division	.0%	.0%	.0%	9.1%	.0%	1.7%
Total	Count	4	16	19	11	9	59
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

55% of all respondents selected Not Applicable

Technology focused Conferences * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	0	1	2	2	0	5
	% within Division	.0%	5.3%	11.8%	13.3%	.0%	7.8%
Effective	Count	4	10	10	9	5	38
	% within Division	100.0%	52.6%	58.8%	60.0%	55.6%	59.4%
Undecided	Count	0	6	4	3	4	17
	% within Division	.0%	31.6%	23.5%	20.0%	44.4%	26.6%
Ineffective	Count	0	2	1	0	0	3
	% within Division	.0%	10.5%	5.9%	.0%	.0%	4.7%
Highly Ineffective	Count	0	0	0	1	0	1
	% within Division	.0%	.0%	.0%	6.7%	.0%	1.6%
Total	Count	4	19	17	15	9	64
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* 52.6% of all respondents selected Not Applicable

Online Courses * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	0	1	3	1	1	6
	% within Division	.0%	5.9%	20.0%	8.3%	11.1%	10.7%
Effective	Count	2	7	4	7	6	26
	% within Division	66.7%	41.2%	26.7%	58.3%	66.7%	46.4%
Undecided	Count	1	5	5	3	2	16
	% within Division	33.3%	29.4%	33.3%	25.0%	22.2%	28.6%
Ineffective	Count	0	2	2	0	0	4
	% within Division	.0%	11.8%	13.3%	.0%	.0%	7.1%
Highly Ineffective	Count	0	2	1	1	0	4
	% within Division	.0%	11.8%	6.7%	8.3%	.0%	7.1%
Total	Count	3	17	15	12	9	56
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

58.5% of all respondents selected Not Applicable

Online tutorials * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	0	1	0	2	2	5
	% within Division	.0%	4.5%	.0%	15.4%	16.7%	6.8%
Effective	Count	1	9	11	6	7	34
	% within Division	33.3%	40.9%	47.8%	46.2%	58.3%	46.6%
Undecided	Count	2	8	8	5	2	25
	% within Division	66.7%	36.4%	34.8%	38.5%	16.7%	34.2%
Ineffective	Count	0	3	3	0	1	7
	% within Division	.0%	13.6%	13.0%	.0%	8.3%	9.6%
Highly Ineffective	Count	0	1	1	0	0	2
	% within Division	.0%	4.5%	4.3%	.0%	.0%	2.7%
Total	Count	3	22	23	13	12	73
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

45.5% of all respondents selected Not Applicable

Participation in E-mail Groups or Listserves * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	0	1	1	0	1	3
	% within Division	.0%	5.3%	5.6%	.0%	11.1%	4.5%
Effective	Count	4	7	5	8	2	26
	% within Division	80.0%	36.8%	27.8%	50.0%	22.2%	38.8%
Undecided	Count	1	9	9	7	2	28
	% within Division	20.0%	47.4%	50.0%	43.8%	22.2%	41.8%
Ineffective	Count	0	1	1	1	4	7
	% within Division	.0%	5.3%	5.6%	6.3%	44.4%	10.4%
Highly Ineffective	Count	0	1	2	0	0	3
	% within Division	.0%	5.3%	11.1%	.0%	.0%	4.5%
Total	Count	5	19	18	16	9	67
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*49.6% of all respondents selected Not Applicable

Books, Journals, Print Resources * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	0	1	3	0	1	5
	% within Division	.0%	3.3%	11.1%	.0%	7.1%	5.0%
Effective	Count	3	12	12	14	10	51
	% within Division	50.0%	40.0%	44.4%	60.9%	71.4%	51.0%
Undecided	Count	2	12	8	6	1	29
	% within Division	33.3%	40.0%	29.6%	26.1%	7.1%	29.0%
Ineffective	Count	1	5	4	2	2	14
	% within Division	16.7%	16.7%	14.8%	8.7%	14.3%	14.0%
Highly Ineffective	Count	0	0	0	1	0	1
	% within Division	.0%	.0%	.0%	4.3%	.0%	1.0%
Total	Count	6	30	27	23	14	100
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*24.8% of all respondents selected Not Applicable

Internet Resources and Web Sites * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	2	6	9	5	0	22
	% within Division	33.3%	17.1%	24.3%	18.5%	.0%	18.0%
Effective	Count	4	26	19	19	15	83
	% within Division	66.7%	74.3%	51.4%	70.4%	88.2%	68.0%
Undecided	Count	0	2	7	2	1	12
	% within Division	.0%	5.7%	18.9%	7.4%	5.9%	9.8%
Ineffective	Count	0	1	2	1	0	4
	% within Division	.0%	2.9%	5.4%	3.7%	.0%	3.3%
Highly Ineffective	Count	0	0	0	0	1	1
	% within Division	.0%	.0%	.0%	.0%	5.9%	.8%
Total	Count	6	35	37	27	17	122
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*7.6% of all respondents selected Not Applicable

Technology Coordinator * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	1	5	4	3	3	16
	% within Division	20.0%	13.2%	11.8%	12.0%	18.8%	13.6%
Effective	Count	2	17	19	13	6	57
	% within Division	40.0%	44.7%	55.9%	52.0%	37.5%	48.3%
Undecided	Count	2	7	7	5	4	25
	% within Division	40.0%	18.4%	20.6%	20.0%	25.0%	21.2%
Ineffective	Count	0	9	3	3	1	16
	% within Division	.0%	23.7%	8.8%	12.0%	6.3%	13.6%
Highly Ineffective	Count	0	0	1	1	2	4
	% within Division	.0%	.0%	2.9%	4.0%	12.5%	3.4%
Total	Count	5	38	34	25	16	118
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*11.9% of all respondents selected Not Applicable

TLC Teacher Leaders * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	1	6	6	3	2	18
	% within Division	16.7%	16.7%	16.2%	10.7%	12.5%	14.6%
Effective	Count	3	19	23	13	5	63
	% within Division	50.0%	52.8%	62.2%	46.4%	31.3%	51.2%
Undecided	Count	1	3	4	8	5	21
	% within Division	16.7%	8.3%	10.8%	28.6%	31.3%	17.1%
Ineffective	Count	1	7	3	2	4	17
	% within Division	16.7%	19.4%	8.1%	7.1%	25.0%	13.8%
Highly Ineffective	Count	0	1	1	2	0	4
	% within Division	.0%	2.8%	2.7%	7.1%	.0%	3.3%
Total	Count	6	36	37	28	16	123
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*8.2% of all respondents selected Not Applicable

Grade Level/Subject Area Meetings * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	1	6	5	1	2	15
	% within Division	16.7%	18.8%	15.2%	4.3%	13.3%	13.8%
Effective	Count	4	12	18	11	5	50
	% within Division	66.7%	37.5%	54.5%	47.8%	33.3%	45.9%
Undecided	Count	0	8	6	8	5	27
	% within Division	.0%	25.0%	18.2%	34.8%	33.3%	24.8%
Ineffective	Count	1	6	3	1	3	14
		16.7%	18.8%	9.1%	4.3%	20.0%	12.8%
		0	0	1	2	0	3
	% within Division	.0%	.0%	3.0%	8.7%	.0%	2.8%
Total	Count	6	32	33	23	15	109
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*18.0% of all respondents selected Not Applicable

School Teacher Guide * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	0	5	8	3	2	18
	% within Division	.0%	14.3%	24.2%	14.3%	11.8%	15.9%
Effective	Count	5	14	16	8	7	50
	% within Division	71.4%	40.0%	48.5%	38.1%	41.2%	44.2%
Undecided	Count	2	10	6	5	4	27
	% within Division	28.6%	28.6%	18.2%	23.8%	23.5%	23.9%
Ineffective	Count	0	6	2	3	3	14
	% within Division	.0%	17.1%	6.1%	14.3%	17.6%	12.4%
Highly Ineffective	Count	0	0	1	2	1	4
	% within Division	.0%	.0%	3.0%	9.5%	5.9%	3.5%
Total	Count	7	35	33	21	17	113
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*15.7% of all respondents selected Not Applicable

Class Release Time * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	1	6	13	2	3	25
	% within Division	16.7%	20.0%	44.8%	11.1%	23.1%	26.0%
Effective	Count	3	16	11	7	6	43
	% within Division	50.0%	53.3%	37.9%	38.9%	46.2%	44.8%
Undecided	Count	2	6	4	6	4	22
	% within Division	33.3%	20.0%	13.8%	33.3%	30.8%	22.9%
Ineffective	Count	0	2	0	1	0	3
	% within Division	.0%	6.7%	.0%	5.6%	.0%	3.1%
Highly Ineffective	Count	0	0	1	2	0	3
	% within Division	.0%	.0%	3.4%	11.1%	.0%	3.1%
Total	Count	6	30	29	18	13	96
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*27.8% of all respondents selected Not Applicable

Telecollaborative Projects * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	1	5	6	3	1	16
	% within Division	25.0%	18.5%	20.7%	15.0%	10.0%	17.8%
Effective	Count	3	10	15	6	5	39
	% within Division	75.0%	37.0%	51.7%	30.0%	50.0%	43.3%
Undecided	Count	0	11	6	8	4	29
	% within Division	.0%	40.7%	20.7%	40.0%	40.0%	32.2%
Ineffective	Count	0	1	1	1	0	3
	% within Division	.0%	3.7%	3.4%	5.0%	.0%	3.3%
Highly Ineffective	Count	0	0	1	2	0	3
	% within Division	.0%	.0%	3.4%	10.0%	.0%	3.3%
Total	Count	4	27	29	20	10	90
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*31.8% of all respondents selected Not Applicable

Youth Initiatives * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	1	9	10	5	1	26
	% within Division	16.7%	29.0%	30.3%	20.0%	10.0%	24.8%
Effective	Count	4	11	16	9	3	43
	% within Division	66.7%	35.5%	48.5%	36.0%	30.0%	41.0%
Undecided	Count	1	7	7	8	5	28
	% within Division	16.7%	22.6%	21.2%	32.0%	50.0%	26.7%
Ineffective	Count	0	3	0	2	0	5
	% within Division	.0%	9.7%	.0%	8.0%	.0%	4.8%
Highly Ineffective	Count	0	1	0	1	1	3
	% within Division	.0%	3.2%	.0%	4.0%	10.0%	2.9%
Total	Count	6	31	33	25	10	105
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*22.2% of all respondents selected Not Applicable

Peer Tutoring or Mentoring * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	1	13	11	7	0	32
	% within Division	20.0%	40.6%	32.4%	30.4%	.0%	29.9%
Effective	Count	4	14	20	11	11	60
	% within Division	80.0%	43.8%	58.8%	47.8%	84.6%	56.1%
Undecided	Count	0	5	3	3	1	12
	% within Division	.0%	15.6%	8.8%	13.0%	7.7%	11.2%
Ineffective	Count	0	0	0	1	0	1
	% within Division	.0%	.0%	.0%	4.3%	.0%	.9%
Highly Ineffective	Count	0	0	0	1	1	2
	% within Division	.0%	.0%	.0%	4.3%	7.7%	1.9%
Total	Count	5	32	34	23	13	107
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*20.7% of all respondents selected Not Applicable

Classroom Observations * Division Crosstabulation

		Division					
		Kindergarten	Grade 1-3	Grade 4-6	Grade 7-9	Grade 10-12	Total
Highly Effective	Count	0	4	5	1	1	11
	% within Division	.0%	19.0%	19.2%	5.6%	10.0%	13.9%
Effective	Count	4	10	14	8	5	41
	% within Division	100.0%	47.6%	53.8%	44.4%	50.0%	51.9%
Undecided	Count	0	6	7	6	3	22
	% within Division	.0%	28.6%	26.9%	33.3%	30.0%	27.8%
Ineffective	Count	0	1	0	2	0	3
	% within Division	.0%	4.8%	.0%	11.1%	.0%	3.8%
Highly Ineffective	Count	0	0	0	1	1	2
	% within Division	.0%	.0%	.0%	5.6%	10.0%	2.5%
Total	Count	4	21	26	18	10	79
	% within Division	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*40.6% of all respondents selected Not Applicable