Working With Colleagues

A GUIDE FOR ICT MENTORS

Contents

Acknowledgements

This Guide derives from the work of Margaret Fryatt and Del Morgan on the Grades 6-9 ICT Integration Initiative, and includes resources originally developed for mentorship training sessions provided in all regions of the province during 2001 and 2002. These resource materials are now revised based on the knowledge gained from these training sessions.

The Ministry wishes to acknowledge Margaret Fryatt and Linda Coupal who provided substantial assistance in the development of these revisions.

Introduction

As an educator, you know ICT offers powerful new opportunities to enrich student learning. You also know teachers need much more than hardware and software to incorporate those opportunities into their teaching. If teachers are to make ICT a dynamic part of their daily work, they need time, resources, training, and encouragement to develop new skills and the confidence to use them.

Purpose

The purpose of this guide is to provide technology-using educators with practical tips and ideas for helping colleagues gain confidence, skills, and new ways of thinking about how they can transform their classrooms with ICT. The guide provides background information on mentoring and a variety of resources and ideas to support professional development that will build knowledge and capacity.

It is important to acknowledge that professional development is only part of the foundation needed to successfully integrate ICT into teaching and learning. This guide is part of a collection of resources provided by the Ministry of Education. The collection provides resources for professional development, teaching and learning, assessment and district planning.

- Getting Started with Integrating ICT
- Sample Units
- Ethics of Information Use

- Evaluating Student Computer-Based Products Scoring Guide

Teaching and Learning

Assessment

ICT Planning

- **Grappling with Accountability**

Staff Development
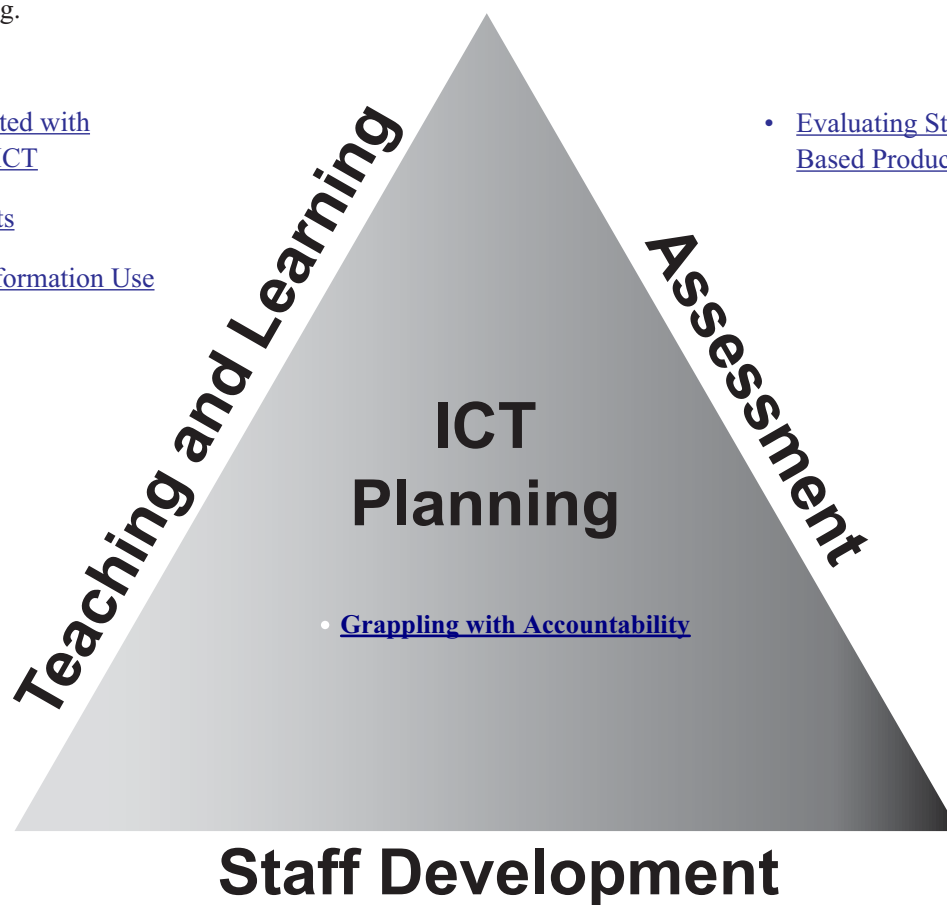
- Working with Colleagues: A Guide for ICT Mentors
- Evaluating Student Computer-Based Products Workshop Guide

MINISTRY RESOURCES SUPPORTING
ICT INTEGRATION

Teaching and Learning

Getting Started With ICT Integration is a resource that provides background information, sample starter projects, and helpful hints for teachers who are interested in integrating ICT in the classroom. The *Research Quest* is used as a model for ICT integration, and suggestions for developing your own technology rich projects and lessons based on this model are provided.

Sample Units illustrate how technology can be used to support student learning, using tools and applications that are widely available in British Columbia schools. Directions to access on-line resources are included with each unit. Each sample unit has a different techology focus and includes information, suggestions, instructions, and templates.

Ethics of Information Use is a resource developed by the British Columbia Teacher Librarians' Association, reprinted and distributed with permission, by the Ministry of Education. It provides guidelines for the referencing and citing of sources used in the research process.

Staff Development

Working with Colleagues: A Guide for ICT Mentors is a companion resource for *Getting Started with ICT Integration* and the *Sample Units*. It provides mentors with principles of mentoring, tips for working with adult learners and supporting teachers through a change process. A primary focus of the document is the development of learning projects and lessons that address provincial learning outcomes and use ICT to add maximum value to student learning. An appendix includes adaptable templates and suggestions for developing action plans with colleagues.

Evaluating Student Computer-Based Products is a guide for a teacher workshop on the assessment of ICT, and includes sample lessons that integrate technology. The evaluation of computer-based products uses "Student Scoring Guides" that can be generated electronically for narrative, expository and persuasive types of communication. Scoring guides can be customized and used to assess both content and the quality of expression within each communication type.

District Planning

Grappling with Accountability is a comprehensive resource to assist district decision-makers in establishing goals and parameters for technolgy programs. The focus is on sustainability and improving student results. A complete set of data collection tools and planning templates are included in the resource.

Four Cornerstones is a brochure with a detailed description of the four cornerstones of ICT integration: Readiness for change; Teaching and Learning; Technology Development; and, System Capacity.

UNDERSTANDING ADULT LEARNERS

Based on their knowledge and experience, teachers have well-developed beliefs about what works and doesn't work in their classrooms. At the same time, they may have had very little experience with technology tools and how to use them in a classroom context. Finding the balance between what each teacher already knows and what he or she needs to learn requires patience, communication, trust, and respect.

Characteristics of Adult Learners	Implications for Mentoring
Adults learn best when the material is personally meaningful to them and applicable to their current situation.	Encourage teachers to set their own learning goals based on what is relevant to their needs and practical for them personally.
Adults learn through challenging but achievable goals.	Start small and build on success. Begin with a familiar unit or activity and make small changes that integrate ICT. Use this as a springboard for other explorations.
Learning is developmental. Adults learn best when learning is tied to past experiences.	Start with what teachers already know. Try to build on these experiences by highlighting similarities and common patterns in different software applications. Most applications are built around similar conventions and keystrokes.
Individuals learn differently.	Be sensitive to learning styles and multiple intelligences for example, some teachers need hands-on practice, others are comfortable following a set of written instructions, and others need demonstrations.
Much learning occurs through social interaction.	Build opportunities for teachers to talk to each other about the skills they are learning and how they are using them.
Learners need feedback to learn.	Provide supportive feedback—Be careful not to identify too many areas for improvement at once.
Learners benefit from having successful strategies explained to them.	Teachers who are experienced in integrating ICT often make things look so easy that novices are not aware they are using learned procedures and strategies.
Learners benefit from a positive emotional climate.	Provide time and encouragement. Technology produces anxiety for some people. Make sure teachers feel comfortable with the progress they are making.

Adult learners bring personal experience and knowledge to the learnng situation. They also need a high degree of autonomy. Paying attention to these qualities will help you to be a more successful mentor.

**Suggested Activites for Exploring
the Needs of Adult Learners**

A)   Critical Qualities of Learning Experiences for Teachers in the Area of Technology:
      Think-Pair-Share

With a colleague or in a small group:

- think about a successful technology learning experience you have had as a teacher. What made it successful?

- share this experience with each other and then identify common elements of your experiences. These can be listed on a chart and organized into categories to be described to the larger group.

To further explore this concept:

B)   Exploration of Opportunities and Barriers of Working with Adult Learners

With a colleague or in a small group:

- create a T-chart on a piece of paper. In one column, list the things that work well with adult learners. In the other column, list problems, difficulties, or obstacles adult learners may encounter.

What works for adult learners	Obstacles adult learners face

WHAT IS ICT INTEGRATION?

"... technology is integrated when it is used in a seamless manner to support and extend curriculum objectives and to engage students in meaningful learning. It is not something one does separately; it is part of the daily activities taking place in the classroom."[1]

Technology is a valuable tool that most of us use in many ways to increase the efficiency of our work and enhance our leisure time. But this definition and use is limiting. Technology can also challenge and extend our thinking and make new learning possible.

A Framework for Looking at ICT Uses

Mentors might find it helpful to consider ICT integration as a spectrum of varied uses. Teachers often begin by learning about a particular tool or application and then using it in familiar ways with typical tasks. As they become more comfortable, they use ICT more extensively and more creatively to enhance student learning. When teacher's skills become fluent, they become aware of a myriad ways ICT can provide new learning opportunities.

One particularly useful framework is the Technology and Learning Spectrum shared here with permission from BJP Consulting for use in British Columbia. It categorizes typical uses of ICT as literacy, adapting, and transforming and describes the accompanying focus on technology, instruction and staff development.

- Literacy uses focus on learning about and using ICT—a skills approach.

- Adapting uses focus on incorporating ICT into existing classroom activities. The incorporation of ICT provides students with new and different tools.

- Transforming uses focus on using ICT that provides students with learning opportunities that are unique to the use of technology. New skills are acquired when they are needed, to accomplish specific tasks within the educational process.

1. Dias, L. (2001). Technology Integration. Learning and Leading with Technology, 27 (3), [Online]. Available:
 http://www.iste.org/L&L/27/3/index.html

TECHNOLOGY AND LEARNING SPECTRUM

	Literacy Uses	Adapting Uses	Transforming Uses
Learning Indicators/Learning Focus	Technology centered pedagogy. Teacher Talk is "technology talk" rather than "learning talk". • Technology uses are organized to acquire and asses technical skills • Technology skills curriculum is in place. • Offered as separate and/or optional experiences/programs. • Allowed when "real work" is completed. considered "alternative reward" activities. • Hardware and software skills acquisition is separate or add-on to curriculum. • Student projects are technology focused rather than standards / learning outcomes intentionally driving the use of technology.	Teacher-centered, direct instruction pedagogy. Teacher talk is "same learning stories even though using new tools" – there is confusion that new tools make new instructional stories. • Technology uses are adapted to traditional curriculum goals and tasks. • Teacher and student roles remain the same. • Learning/ assessment practices are unchanged. • Low cognitive task when using the technology. • Student experiences depend upon teacher directed assignments. • Technical skills are learned with the academic curriculum but the talk is "tech talk" rather than "learning talk". • Teachers view technology as interesting but optional and unnecessary to achieve present curriculum goals.	Student- centered, constructivist pedagogy. Teacher talk about student work is about new learning stories using new tools. • Technology uses enable new learning tasks not possible without technology. • Learning/ assessment practices changed. High cognitive tasks for fluency in accessing, processing and communication information. • Students become explorers, producers of knowledge, communicators and self-directed learners. • Teachers become facilitators, designers, learners and researchers. • Students initiate technology uses as they create their own learning experiences. • Students and teachers are collaborating and learning together. • Teachers view technology as essential for development of higher-order thinking skills.
Technology Focus	Technology use learning tasks.- "Just-in-case" technology skills are acquired for possible future needs. • Literacy classes- either stand alone or embedded within classes like business. • Learning keyboarding. • Learning hardware and software. • Learning programming languages including html. • Playing games or other technology activities during "free time". • Student's projects are technology focused rather than expecting standards to intentionally drive the use of technology for learning. • Curriculum provides "topics" for technology uses.	Optional/ Adaptive Learning Tasks- Integrating is translated into "use it for something, anything … just use it". "Do what you can, do what you want". • Drill and practice with content software. • Instructional games as skill practice. • Productivity tools used to modify or vary traditional assignments given in the past.	Essential/ Re-culturing Learning Tasks - Integrating is "just-in-time," technology skills developed as needed for learning, projects essential to meeting outcomes and standards. • Complex learning and thinking tools- such as simulations, mathematical modeling, mind mapping. • Community learning tools for collective learning such as groupware, listservs and collaborative software. • Assessment tools, such as electronic portfolios. • Productivity tools used to construct meaning and produce information useful to others.

Table 4: Grappling's Technology and Learning Spectrum, *Grappling with Accountability 2002*

MENTORING AS A PROCESS

The ICT mentor has a critical role. You provide colleagues with training, support, and advice, and collaborate with them as they move towards more effectively integrating ICT into their teaching and learning.

As a mentor you help teachers:

*   Understand the various uses of ICT and the research process in learning and teaching

*   Develop learning experiences for students using ICT and the research process to achieve the provincially prescribed learning outcomes

*   Gain the confidence needed to contribute to the professional development of colleagues.

As a mentor, you have the opportunity to create a collegial working climate that is trusting, mutually respectful, informal, collaborative, and supportive.

Mentoring—A Learner-Focused Relationship

Mentoring is a learner-focused relationship. The aim is to provide an appropriate degree of challenge and support so participating teachers can build competence and the confidence to solve their own problems. It is about fostering independence.

Mentors are called upon to act in different capacities depending on the needs of the teachers they are mentoring. There are three different roles that you may need to assume as a mentor.

*   As a consultant, you are a source of information. It is important to balance support with challenge by providing several suggestions or recommendations from which the learner may choose. The goal is to foster independent problem solving.

*   As a collaborator, you share in planning, decision-making, and problem solving. Ideas can be developed in a number of ways, such as brainstorming or exploring resources, but decisions and choices are made as a team. Successful collaboration leads to mutual growth, learning, and respect.

*   As a coach, you provide support and encouragement. Taking a non-judgmental approach is crucial, as your purpose is to lead participating teachers to reflect upon their progress and identify where they want to direct their efforts.

Skilled mentors shift easily from one type of interaction to another as appropriate to the situation and the developmental level of the learner.

Who Does Most of the Talking?

M	**MT**	**M**	**MT**	**M**	**MT**

Consulting   Collaborating   Coaching

M = Mentor   MT = Mentee Teacher
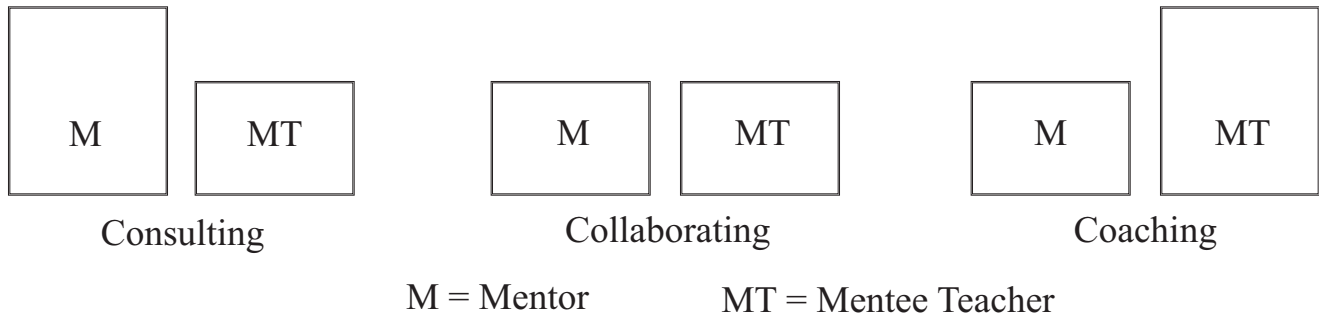
As a consultant, the mentor is often seen as the person who supplies the answers.[2] This contrasts with the situation where the mentor is acting in a coaching role and the mentee teacher is doing most of the talking. The most empowering roles for the mentor to assume are the roles of collaborator and coach. As collaborators, the two parties work together to find answers. As a coach the mentor supports the mentee teacher in finding his or her own answers.

Characteristics of a Good Mentor

There is no single set of characteristics that all mentors must possess, however, the list below describes some of the qualities that many good mentors share. Naturally, not everyone has every characteristic. The list helps you focus on the strengths you bring to mentoring and the challenges you may face.

• *Strong Interpersonal Skills*—Are you a people person? Do you like working with others?

• *Technical Competence*—How strong are your skills? Can you guide people towards finding an answer, even if you dont know the answer yourself?

• *Patience*—Change takes time. Try to remember when you were first learning about ICT. What seems like second nature to you now may seem like a second language to a new user.

• *Trustworthiness*—As a mentor, you often gain information that should be kept confidential. Your mentee teachers need to be able to trust your professionalism.

• *A Non-judgmental Attitude*—Thinking poorly of a mentee teacher will show in your behaviour or attitude. This will inhibit their will to learn.

• *Belief in Lifelong Learning*—New learners are especially glad to see that mentors still learn. This confirms that learning is a lifelong process.

• *Skill at Providing Instructional Support*—Most people learn processes best by going through them step by step. Take care to cover all the details and avoid assuming teachers already know some steps.

• *Good Listening Skills*—Take time to clearly understand the needs and perspectives of the mentee teachers

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2. Lipton, L. & Wellman, B. (2001). Mentoring matters: A practical guide to learning focused relationships
Sherman, CT: MiraVia.

The Rewards of Being a Mentor

Being an ICT mentor to colleagues is personally rewarding because you:

• Make a contribution to your profession

• Learn from mentee—increasing and reinforcing your own knowledge

• Build new professional relationships that extend your network

• Help to establish a climate of collegiality within your school or district.

Suggested Activities for Exploring Mentoring

With a group or partner:

A) Discuss the question, "What is mentoring?" After exploring the idea, represent the results of the discussion using any effective means for communicating your thinking. (Consider metaphors, alliterative poems, mini dramatizations, diagrams, songs, symbols, or whatever comes to mind.)

B) Think about someone who has acted as a mentor for you. Share the qualities this person exhibited. This may be through stories about your mentor or a list of the personality traits and skills that had the most impact on you. Compare the findings to the Characteristics of a Good Mentor found in Appendix 1.

C) List the personal qualities that build learner-focused relationships, where the mentor supports learning and learners are in charge of the learning, identifying what is important and the context within which they are willing to apply new skills and ideas.

SETTING UP A MENTORING PROGRAM IN ICT

Visions and Goals

A mentoring program in ICT best begins with an understanding of the district's vision of how ICT supports teaching and learning. Once this vision is clear, then districts and schools can identify the steps that are necessary to achieve the vision. Bernajean Porter describes this process as creating a worthy destination.

> "The group that collectively plans their destination BEFORE getting on the plane will happily arrive with plenty of fuel and resourcefulness, fully prepared to enjoy the new place of their choice."[3]

The *Grappling with Accountability* tools licensed by the Ministry of Education for use in BC will assist districts in gathering data and planning their destination. Goal setting is an essential part of this process and should be aligned with the school district's Accountability Contract and School Growth Plans.

Useful District and School Models

A school based team, where an ICT mentor works with colleagues in their own building, is an effective component in a mentoring model of staff development. When mentors work with colleagues in their own school building, mentors:

- Are available when problems arise and help is needed

- Are familiar with constraints on and opportunities for ICT use

- Can work informally with colleagues and enjoy greater flexibility

- Create a stronger sense of critical mass. Teachers are able to see models of integration in action. Ripples of interest are created as teachers who are not part of the project see colleagues and students excited by new possibilities and opportunities.

A second effective strategy is the creation of technology focus groups. These groups meet at monthly meetings, perhaps over dinner. Together, members of the group explore issues of ICT use in schools and classrooms, share solutions to problems, and learn ICT skills.

Recruiting and Selecting Mentee Teachers

Build awareness about the mentoring program in your school or district before asking teachers to indicate their interest in mentorship. You may use a referral process, or ask teachers to indicate their interest directly. Some districts select teachers who have begun to use ICT, while others select teachers who are not currently technology users but who are recognized teacher leaders. There are many ways to make the mentoring program successful.

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3. Bernajean Porter, Grappling With Accountability: Resource Tools for Organizing and Assessing Technology for Student Results. Bjpconsulting. 2001

Gathering District Information and Resources

You will find it helpful to gather information about the ICT resources available in your district and how these are being used. Here are questions to consider.

- What professional development and in-service support for ICT integration does the school district offer? How do teachers access available funds and programs?

- What local resources are available to support the mentoring program. See Appendix 2, *Scan of Available Technology Resources*.

- What software acquisition policies or guidelines does your district have? What site and provincial software licenses does your district currently have? Do these include home use for teachers?

- Does your school district have a plan to assist educators to purchase personal ICT equipment and/or software through loans, bulk purchases, etc.?

- What technical support is available in your district? How do people access this support?

- Are there central resources or a pool of equipment that can be loaned to schools or teachers for limited periods of time? How is it accessed?

- Are there school or district standards for equipment? How are these decisions made?

- What is the district Acceptable Use Policy for the Internet and computers? Does each school have a separate one, or is it the same?

- Does your district provide information to parents regarding Internet safety? What kind of information? What are teachers' obligations?

- Does your district provide e-mail accounts to students? What guidelines or policies exist? Can schools establish their own policies?

- Are students assigned individual passwords to log on to the computers? What other security precautions are in place?

- Does your school or district have a technology committee and can you become a member of the committee to influence the decision-making processes and allocation of resources?

These will get you started, but if you think of other important issues, please add them to the table in Appendix 3, *District Information to Consider*.

GETTING STARTED WITH ICT MENTORSHIP

Planning Initial Mentoring Meetings—Outlines, Models and Materials

Since there are as many approaches to mentoring as there are mentors involved, there is no one best way to proceed. Begin by bringing participants together to explain the project, process, time frame, and expectations in broad terms. Giving teachers some time to get to know one another helps them to create a support network. Try to create an informal, friendly environment where personal as well as professional relationships can be established. Appendix 4 provides a sample outline for meetings with mentees.

You may follow up on initial meetings by visiting teachers in their schools or classrooms. These visits will give you a better sense of the technology tools they have available and also provide a glimpse of the teaching styles and learning preferences of mentee teachers.

Assessing the Needs and Interests of Teachers

Teachers direct their own learning to meet the needs that are important in their work. Several tools are suggested in the following sections to help teachers identify their own ICT needs and interests, find out what tools are available to them, and begin the process of creating personal action plans with specific goals and objectives.

Self-Assessing ICT Skills

Mentors may use a number of tools to help teachers get a sense of their current technology skill levels and to identify starting points for them. The purpose of the self-assessment process is to help teachers identify areas of interest, rather than to suggest a set of pre-requisite skills that must be learned before the work begins. The most valuable learning occurs when skills are learned in context and applied immediately. Appendix 5, *Technology Self-Assessment* is a place to start.

To get a complete picture, it is a good idea to use a variety of instruments, including checklists, interviews, rubrics, and self-assessments. It is also important to use interviews, questionnaires, and group discussions to assess attitudinal factors, such as each teachers comfort level with various uses of ICT, attitudes toward change, and approaches to collaborative work.

Scanning Local Technology Resources

It is very helpful for teachers to find out what technological tools, applications, and resources are available to them in their schools or districts. See Appendix 2, *Scan of Available Technological Resources*.

You should also ensure that mentee teachers are familiar with school and district policies and have an understanding of the important issues surrounding acceptable, safe, and responsible use of the technology and the Internet.

Creating Personal Action Plans

After completing a technical skills self-assessment and getting a sense of the local technology resources available to them, teachers can begin creating their own plans for action. While the self-assessment will identify some learning needs, teachers should identify their own priorities. This is a critical aspect of the process — learners must be self-directed so they are working towards goals that are important in their teaching lives.

Plans do not need to be elaborate. The charts below include guiding questions for mentors. Two stages are described below. The first stage, *Pre-Planning*, will likely occur only once, the second stage, *Action Planning*, will likely occur several times as each new goal is reached and new goals are set. See Appendices 6 and 7 for the Pre-Planning and the Action Planning templates.

Action Plans can provide teachers with a record of their personal professional growth in the area of technology. It is important to ensure these initial experiences are successful. Encourage teachers to start with something they are already doing in their teaching and help them integrate specific ICT tools, skills and strategies where appropriate and effective. Remember: this journey needs to begin with small steps.

Pre-Planning

Guiding Questions for Mentee Teachers (MTs)	Questions for Mentors to guide reflection
Pre-Planning: Exploring a Focus	
What excites me about my teaching? About technology? How am I currently using research and the research process in my classroom? What are some of the things that I would like to explore around technology?	What are your favourite units? What are some of the things that you do really well with your students? What is one thing that you would like to do differently in your teaching? How can you blend your interests in teaching with your interests in ICT?
Pre-Planning: Self-Assessment	
What are my current ICT skills? What are the gaps I want to fill? What tools are available in my school? What technology learning is a priority in terms of my needs and interests? What resources/ support can I draw upon to learn on my own? in my school?	Are there some basic skills I will need before I proceed? What should my first priority be, given that I have limited time? Which skills might add the greatest value in my classroom? What are my immediate learning goals? What are my long-term learning goals?

Action Planning

Guiding Questions for Mentee Teachers (MTs)	Questions for Mentors to guide reflection
What do I want or need to learn first?	
What is my immediate goal? How will this goal move me towards my long-term goal? What is a logical time frame?	How can I make MTs aware of all ICT possibilities, prerequisite skills, and how to build from one level to another? Can teachers work with colleagues to acquire skills or share expertise?
How will I use this new tool/skill/strategy?	
Where does it support the research process? How else might I use this? Is this going to be worth the time, energy and effort? Will it support learning and instruction, enhance it, or make new learning experiences possible in my classroom?	Consider the time required to learn the tool in relation to its general utility (not to discourage MTs from trying new things, but simply to make sure they are aware of what might be involved in terms of effort for the potential gain). How does this tool link to research and the Research Quest? To effective and appropriate uses of ICT? Does the MT need help in identifying clear and practical steps?
What will success look like?	
What will I be doing differently? What will my students be doing differently?	What are the expectations for student performance? What specific strategies will be used to assess student work?
How will I monitor my plan?	
What kind of data can I collect? What kind of feedback will be most helpful from my mentor? What is working for me? What is still a concern?	What feedback might be useful? What adjustments or corrections might be made? What is going really well? What concerns exist? What have you learned that might be shared with others? What variations and adaptations are possible? Can you use this in other settings?
What is my new goal?	
	How does this lead to achieving the long-term goal? What are the next steps in the process?

Suggestions for Working With Mentee Teachers

- **Network.** One of your first pleasures is to meet everyone and develop a community of learners. Share phone numbers, school names, email addresses and interests.

- **Show what can be done.** Provide an overview of available technologies, accompanied by brief illustrations of how they support student learning. At the same time, remember, nothing is more overwhelming to new learners than being swamped with details and technical language they don't understand.

- **Use user-friendly non-technical language as often as possible.** Avoid jargon. Explain the terminology, acronyms, and jargon that you use. Many people do not know what URL, RAM, or gig mean. Create a jargon and acronym board for your training. Every time someone uses jargon or an acronym, have him or her write it on the board and explain what it means.

- **Use the expertise of the group.** Identify individuals within your group who have been early adopters of technology and are prepared to work with others. They will help create a collaborative network of learners.

- **Tailor working sessions.** Create working sessions that meet individual needs. Teachers should be acquiring skills they believe they need and will use. Give them time to begin experimenting with these skills in their classrooms.

- **Leave the learning in the hands of the learner.** Be a guide on the side or a mentor in the centre. Let learners solve their own problems. It can be difficult to stop the impulse to jump in with solutions. While this can be personally satisfying, it does not lead to independent problem posing and solving by learners. Find ways for participants to learn from their mistakes.

- **Model and provide guided practice in new technology skills.** Use the teachable moment to model and provide guided practice to support learners.

  - Demonstrate the process by showing and explaining at the same time.

  - Ask teachers to demonstrate and apply the process while you observe and provide guidance or assistance as necessary. Make sure the teacher is in charge of the technology in question.

  - Think out loud as you demonstrate to reflect what is going on and why.

  - Make notes for participants as they walk through the process again so they are confident they know the steps involved.

- **Start small and build on success.** Suggest mentee teachers start small, with relatively easy-to-manage projects that provide a high degree of success. If possible, match colleagues who are interested in working together. Collaborative efforts will turn small explorations into powerful learning experiences for everyone.

- **Slow Down.** Take time to allow participants to absorb and use new knowledge. It takes time to learn new skills, to experiment with various applications of these skills, and to reflect on what works and what doesn't. It also takes time for teachers to get a sense of how and where technology can best be used within their particular setting. This time is well spent in the long run.

- **Be constructive in your comments.** Praise efforts that are leading to good things. Offer concrete suggestions on how to improve skills or projects. Adult learners are often overly self-critical and need evidence of their success in order to move forward.

ICT Uses and the Process of Change

Change takes time. One of the most common barriers to successful ICT integration is the difficulty of changing instructional practices. In integrating ICT, teachers are asked to use new tools, as well as to rethink how they organize and manage their instruction.

Rogers Diffusion of Innovation Theory[4] proposes an explanation for how innovations are adopted over time. Five important elements affect how quickly an innovation spreads. The more elements present, the greater chance the innovation will be successfully adopted. Addressing these elements in your work with teachers may make the process of change easier for them. Consider:

Relative Advantage

Is the innovation better than what it replaces? Is the change worth it? Are there risks involved? Teachers may be wondering if the effort of learning about, and using, ICT is worth the work involved. As a mentor, one of your tasks may be to help teachers focus on tools that provide a high degree of added value.

Observability

Can others see how the innovation works and observe the results? Are results visible? If mentors can provide teachers with examples of high quality work produced by students as a result of integrating ICT, they will be more likely to want to use ICT in their classrooms.

Compatibility

How does the innovation align with the individuals existing beliefs, values and attitudes? The closer the match, the more likely the adoption of the innovation will be successful.

Complexity

Have you made the change easy to understand, maintain, use, and explain to others? Identifying the best starting point for participating teachers and providing them with just enough information to be successful — but not so much to confuse — may be a difficult task for mentors, but it is important.

Trialability

How easy is it for individuals to try the change on a limited basis? Successful first experiences with technology are critical as they tend to increase confidence and make people excited about trying more ICT integration activities.

Awareness of these elements may help mentors alleviate teacher reluctance or confusion when it arises.

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4. Quotes in Dias, Laurie. "Technology Integration." Learning and Leading with Technology, Vol. 27, No. 3, (2001)
 http://www.iste.org/L&L/27/3/index.html

THE WORK OF INTEGRATION - FIRST STEPS

It is important for you as a mentor to ensure colleagues are successful in their early efforts so they develop confidence and competence. Several approaches are worthy of discussion.

Start with an Existing Unit, Project or Lesson

One way to get started and increase the level of success is to build on what teachers are already doing. Work with units and projects they are already using with their students, and look at how ICT might be successfully integrated. This starting point is comfortable and concentrates attention on the technology.

For example, have mentee teachers bring a unit they use successfully to a group meeting. After sharing the units, the group selects one unit to work on as a team. This strategy creates many opportunities to discuss issues about appropriate and effective uses of the available tools. A variety of alternatives will be suggested and explored, giving mentee teachers a sense of the possibilities. After working in the group, have mentee teachers work in pairs on a second unit and share their recommendations with the larger group. When this second cycle is completed, teachers will be much more confident integrating ICT into existing units and ready to plan new units.

Identify and Explore How to Use a Group-Selected Tool

Start by identifying a specific tool or application that all members of the group want to learn to use. After a brief introduction to some basic skills, they can practice independently, or in pairs. Experiences are later shared, giving a broad picture of potential uses.

For example, the group of mentees may identify an interest in learning about PowerPoint. The mentors would spend a small amount of time demonstrating the application. Mentee teachers then experiment with the tool by themselves. Some teachers use it with students while others may use it to support their administrative work or personal interests where they find it easier to take some risks. When experiences and products are shared, use them as a starting point for discussions about using PowerPoint to support and extend student learning.

Select Generic Lessons from the Sample Units or Getting Started With ICT Integration

Another approach to getting started is to select and test some of the generic lessons from the Getting Started with ICT Integration or the Sample Units. Teachers apply these lessons to what they are currently doing and then share the results of their experiences with the rest of the group. This is a more manageable approach than trying to work through a complete unit of study.

Select Starter Projects

For some, the most powerful introduction to integrating technology is learning from an experienced teacher. A list of starter projects from the Internet showing simple ways to provide new learning opportunities for students is available in Getting Started With ICT.

ICT INTEGRATION:

BUILDING YOUR OWN LESSONS

Integrating ICT effectively and appropriately means creating lessons that:

- Have curriculum connections that support purposeful and engaged learning

- Have assessment and evaluation processes that begin with the end in mind

- Are effective learning experiences with strategies such as the research process and critical thinking.

A Framework for Developing Projects, Units, and Lessons
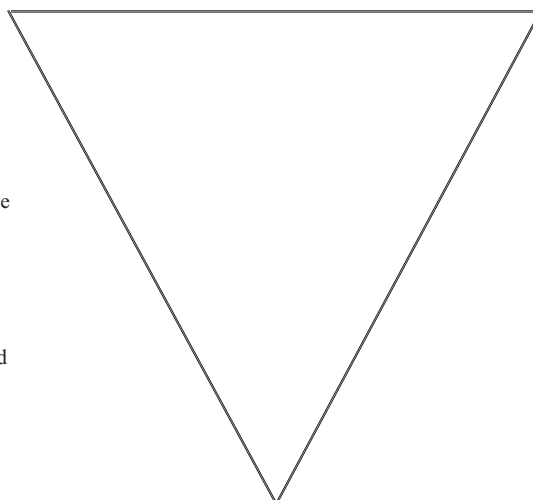
2. Assessment and Evaluation

Define the learning outcomes and desired results

Does this project:

Identify critical or essential questions to drive the process?

Provide value for time & energy invested?

Focus on application of skills in complex and authentic (real life) contexts?

1. Curriculum Connections

Transfer and generalize to other areas?

Identify how students will demonstrate they have achieved the desired results

Does this project:

Allow students to demonstrate a range of performances? (Task is open-ended)

Provide for the collection of evidence over time and from a variety of assessment tools?

Consider aspects of validity (can students do well without understanding?) and reliability, (can students who understand do poorly)?

3. Effective and Appropriate Learning Experiences

Consider how ICT can add value to the student learning experiences you have identified

Does this project:

Use literacy, or adapting, or transforming uses of ICT?

Capitalize on unique capabilities of available tools to:

- Collaborate and communicate beyond the classroom,
- Access new information sources,
- Allow students to reach new audiences for new purposes,
- Communicate what they are learning in new ways,
- Organize and analyze information in new ways?
- Effectively and appropriately support students in their learning?

5. adated from McTighe, J. and Wiggins, G. (1998). Understanding by Design. http://www.ascd.org/readingroom/books/wiggins98book.html

The Research Quest and Critical Questions

One very productive way to integrate ICT into core subject areas is to conduct research using the Research Quest model.[6]

Students often conduct topical research—finding information on particular subject areas or themes and recording that information in the form of a written report. Such research rarely challenges students to engage in critical thinking.

Critical questions reside on the uppermost levels of Blooms taxonomy of cognitive skills: analysis, synthesis, and evaluation.[7] Critical questions have no single right answer — they require students to make choices, weigh alternatives, make judgments, and justify their decisions. Critical questions are open ended and often messy, connecting students to real problems and issues that link the curriculum to the real world. They can be powerful vehicles for engaging students.

Ian Jukes[8] talks of moving learning from *LOTS* (*Lower Order Thinking Skills*) to *HOTS* (*Higher Order Thinking Skills*). The Research Quest model is a vehicle for integrating ICT with a focus on higher order thinking skills. The Quest process provides a way to involve students in research tasks that demand critical thinking and the intentional use of information to solve problems, make choices, and defend personal judgments. It encourages students to move beyond tasks that require them to simply retrieve and communicate information, to tasks that require them to use the information in a critical way.

Plagiarism is a problem that is becoming more prevalent since students gained access to the Internet. Copying and pasting information from an on-line source and passing it off as one's own work becomes very difficult when students are addressing critical questions. The Research Quest, when driven by a critical question, provides a pro-active response to a difficult problem.

Tips for Defining Critical Research Questions[9]

A carefully designed critical question is the key to developing learning opportunities that demand higher-level thinking. The critical question may be defined by the teacher, or by the students themselves as they become more familiar with the research process.

A critical question should:[10]

•	Require critical thought rather than the simple retrieval of information

•	Allow the researcher to draw conclusions or make judgments that can be supported by the researched information

•	Provide opportunities for original thinking

•	Allow the researcher to examine alternatives and make justifiable choices

•	Allow the researcher to apply knowledge and skill beyond school applications

•	Allow the researcher to make personal connections

•	Focus on the really important concepts or big ideas of the curriculum

6. Getting Started With ICT, Ministry of Eduction; BC Teacher Librarians Association

7. Bloom, B.S. (Ed.) (1956). Taxonomy of educational objectives: The classification of educational goals: Handbook I, cognitive domain. Toronto: Longmans.

8. Jukes, I. and McCain, T. (2000). Developing an Instructional Model for Effective Technology Usage © The InfoSavvy Group and Cystar, [Online] Available: http://www.thecommittedsardine.net/jukespresents.html

9. Teachers who want to learn more about developing critical challenges for students may benefit from the series of resources from TC[2], The Critical Thinking Cooperative, a partnership of BC school districts, faculties of education, teacher professional development associations, and other educational organizations. The TC[2] series of curriculum linked resources, edited by Roland Case and LeRoi Daniels, is titled *Critical challenges Across the Curriculum*.

10. School District #44, North Vancouver, 2000. Web in the Classroom: A Resource for Classroom Teachers

Suggested Activities for Exploring Critical Questions

In pairs or small groups:

A) Identify Key Features:

*   Compare the questions in Column A to those in Column B of *Critical Question Activity Part I* (Appendix 8)

*   List key features of the Column A questions. Share these features with the large group and create a master list

*   Select the five criteria that seem to be most important to high quality critical questions

B) Applying the Criteria — Finding examples and non examples

*   Read *Critical Question Activity Part II* (Appendix 9)

*   Decide which *are* and which *are not* examples of critical questions

*   Transform non-critical questions into critical questions

C) Generating Critical Questions

*   Partner with someone who teaches the same grade or subject as you and list unit topics they are currently using with students

*   Generate critical questions that will focus student research efforts

*   Share. To extend the activity, record the suggested questions, post them around the room, and give participants time to add refinements, variations, or additional questions.

See Appendix 10 for a lesson planning template based on these concepts.

SUSTAINING THE LEARNING PROCESS

Building and Maintaining Mentoring Relationships

Maintaining regular contact with teachers provides them with opportunities to share successes or questions and to ask for specific assistance. Sustaining a positive mentoring relationship, and communicating on a regular basis with mentee teachers about their progress, their needs, and the challenges they face, are ongoing responsibilities of the mentor.

Teachers should be encouraged to reflect on their progress towards their goals, regularly modifying and adapting their plans.

Specific suggestions from experienced mentors include the following:

- Schedule regular get-togethers that provide some social interaction such as monthly meetings after school or dinner meetings every two months

- Create an email list or bulletin board to keep participants connected between meetings

- Circulate items for comment or discussion

- Share items of interest and useful resources

- Reach beyond the district to connect with teachers in your region or across the province with similar interests

- Celebrate successes

- Assess progress in relation to goals on a regular basis. Frequent checks make it easier to keep things on course

- Encourage teachers to support each other in their work and have them share what they are doing in their schools and in the district

- Promote the process and the works in progress

- Invite others to see what is happening and honour the work being done.

Closing Mentoring Relationships

It is often useful to have a time limit on the formal mentoring relationship. This provides an opportunity for both participants to make agreements about plans and activities, assess progress, and make a formal decision about what a continued relationship, if any, will be. The following are suggestions for bringing your relationship to a close:

- Encourage mentee teachers to repeat the self-assessment and note their progress

- Discuss with participating mentee teachers and other colleagues the benefits you have mutually derived from the mentoring relationship

- Celebrate success in some way

- Be clear that the formal stage of your mentoring is now complete

- Create a new relationship if that is mutually agreeable.

A Final Word

Integrating technology requires more than learning basic ICT skills. To be effective and lasting, the successful integration of technology must be based on sound pedagogy.

The principles of learning listed in the Integrated Resource Packages relate to all learning in BC schools.

- Learning requires the active participation of the student.

- People learn in a variety of ways and at different rates.

- Learning is both an individual and a group process.

Creating learning environments based on these principles is critical to the successful integration of ICT that enhances and transforms teaching and learning. Additional suggestions for organizing and managing the classroom are found in Appendix 11.

Mentorship is a learning relationship focused on building capacity and fostering independence. We encourage you to share your work with colleagues, as the building of collegial relationships will enhance the success of students and our professional stature.

APPENDICES

Appendix 1 Characteristics of a Good Mentor

Read each descriptor and place a check mark where you think you are. This tool will help you assess the strengths and weaknesses you bring to mentoring.

	Rarely	Sometimes	Frequently	Most of the time
I have good people skills				
I like working with others				
I am competent with the technology				
I know where to look for assistance				
I see myself as a competent professional				
I am patient and tolerant when teaching someone a new skill or task				
I have skills for dealing with frustrating situations				
I am sensitive to the needs of others				
I listen without judgment				
I am willing to learn in front of others				
I am confident and secure in my knowledge and make an effort to stay up to date.				
I am flexible and willing to adjust				
I can guide learners through the steps of using technology tools				
I am able to offer assistance or resources when others are challenged				
I am able to facilitate learner-directed learning				
I know when others need support or independence				
I like to share my knowledge				
I use inclusive language and behaviour when introducing new technology				
I want to contribute to the professional development of others				
I am an effective communicator				
I respect colleagues, valuing differences				
I am able to support and advise				
I set high standards for myself and those around me				
I have a professional growth plan that addresses growth in education technology				
I model good use of technology in my classes				
I apply technology to increase critical thinking skills and creativity in my students				

Appendix 2 Scan of Available Technology Resources

Please modify this list as needed.

What type and number of computers are available to you?	Mac:	PC:

How many computers are available to you in each of these locations? How many are connected to the Internet and at what speed?

	Total Number	# with Internet	Speed
Classroom: Computer Lab: Library: Other:			

Equipment

_____Scanner   _____ Digital Camera   _____Camcorders   _____Colour printer

_____Black-and-white printer   _____ LCD projector   _____Other

Software

Productivity Suites	**Other Software**	**Internet Browsers**
☐ AppleWorks	☐ HyperCard ☐ PageMaker	☐ Internet Explorer
☐ ClarisWorks		☐ Netscape Navigator
☐ Microsoft Office	☐ HyperStudio ☐ Photoshop	
☐ Microsoft Works	☐ KidPix	
☐ Lotus	☐ Inspiration	
☐ Other:	☐ Outlook ☐ Eudora	
	☐ Others:	

Other Technology available to you:

Appendix 3 District Information to Consider

	Comments
Find out about your district technology plan. What professional development and in-service support for technology integration does it offer? How can participants access available funds/programs?	
What software acquisition policies or guidelines does your district have? What site licenses/provincial licenses does your district have?	
Does your district have a plan to assist educators in purchasing home technology equipment and/or software through loans, bulk buys, etc.?	
Are technical support personnel available in your district? How do people access this support? Are there restrictions on their use and availability?	
Is there a central resource or pool of equipment that can be loaned to schools or teachers for limited periods of time? How is it accessed?	
Is there a minimum standard or level of equipment for each elementary and secondary school in the district? Who makes these decisions in your district? How are choices made?	
What is the district Acceptable Use Policy? Does each school have a separate one, or is it the same?	
Does your district provide information to parents regarding Internet safety? What kind of information?	
Does your district provide email accounts to students? What guidelines or policies exist? Can schools establish their own policies?	
Other	

Appendix 4 Sample Outline for Meetings with Mentees

Meeting 1:

- Get to know participants

- Introduce program

- Gather contact information

- Talk about schedules

- Establish personal boundaries re: contact times and availability

- Share: Technology Self Assessment, Pre- Planning Template and Scan of Resources

Meeting 2:

- Gather self assessment information

- Establish priority needs

- Group teachers so they can share skills

- Share pre-planning reflections

- Establish interests, possible goals etc.

Meeting 3:

- Ask individuals to bring a unit or project that they have used in the classroom

- Share, then select one or two to work on as a large group

- In the large group, suggest a variety of ways to successfully integrate ICT into the selected unit. Use this as an opportunity to discuss effective, and appropriate uses of tools

- Work in small groups or pairs to explore how technology might be integrated into this unit of instruction

- Present small group findings

Subsequent Meetings:

- Create Personal Action Plans and timelines for each person

- Select tools/ applications for group exploration

- Explore developing resources using critical questions and the research process

- Share successes and problems

- Teach process of providing feedback by offering a project for peer review

Remember, providing on-going support is easier if communication is frequent and sharing sessions are scheduled regularly.

CELEBRATE SUCCESSES

Appendix 5   Technology Self-Assessment (three pages)
Indicate your current level of proficiency for each item.

N = Novice ➜ I = Intermediate ➜ A = Advanced	

1. Core technology skills

N	I	A	
			Use a mouse to point, click, and drag.
			Save documents both on the hard drive and on another drive.
			Know what to do if a computer locks up.
			Disconnect the computer and set it up in another location.
			Install application software.
			Start up and shut down the computer; open and close a program; insert and eject a disk or CD-ROM.
			Open a file from a disk or folder and save a file to a disk or folder.
			Select printers and solve common printing problems.
			Create and maintain backups.
			Create and organize favourite files (e.g. copy, rename, move and/or delete files).
			Use a word processor for personal correspondence.
			Cut, copy, and paste text within an application and between applications.
			Use a database to enter, edit, sort, manipulate, and interpret data.
			Use a spreadsheet to enter, edit, manipulate, graph, and interpret data.
			Send, reply, and forward email.
			Send and read email attachments.
			Access a specific web page (URL) and search the Web using a variety of tools.
			Evaluate search engines and know which one to use.
			Determine the validity and reliability of information obtained through a variety of electronic resources.
			Use the video projector for a classroom presentation.
			Use electronic resources (e.g., on-line encyclopaedias, catalogue, WWW) to locate information.

2. Beyond core technology skills

N	I	A	
			Change default settings.
			Use troubleshooting techniques to solve basic technical problems encountered when using instructional technology.
			Connect a computer to a projection device for a presentation or whole-class instruction.
			Configure a computer to connect with a network.
			Use imaging devices such as scanners and digital cameras.
			Perform advanced formatting functions such as page numbering, customized tabs, headers and footers, bullets, styles, special indentations, borders and shading, etc.
			Perform advanced editing functions such as inserting breaks, searching for and replacing text, hiding and displaying paragraph marks, using the clipboard, etc.
			Develop and present an electronic multimedia presentation such as one created in PowerPoint or HyperStudio.
			Create a graph from spreadsheet data.
			Create a report (query/find request) in a database and sort the results.
			Insert an object, graphic, or audio file into Word or PowerPoint.
			Use mail merge to create and print form letters, envelopes, and mailing labels.
			Import and edit a variety of graphic images from various sources
			Reduce, enlarge, or crop a graphic and convert graphics from one file format to another.
			Record video footage and import/export to and from computer and VHS tape.
			Use email, newsgroups, or other web browser applications to obtain primary research from professionals, target audiences, or companies.
			Create and manage a classroom web page.
			Download and decompress files/images from the Internet.

3. Use technology for teaching and learning

N	I	A	
			Electronically process lessons or assignments.
			Develop lesson plans integrating word processing into core curriculum objectives.
			Research lesson plan ideas on the World Wide Web.
			Develop a listing of URLs that correlate with curriculum and computer skills.
			Use the Internet to enrich and improve teaching.
			Create an assessment rubric for ICT skills.
			Identify Internet resources for rubric development.
			Access and utilize research and resources on the Internet.
			Have a personal professional development plan that addresses growth in the area of educational technology.
			Evaluate, select, and integrate computer technology-based instruction in the curriculum of the appropriate subject area and/or grade level.
			Use the students as the experts in areas of technology.

4. Integrate technology into the curriculum

N	I	A	
			Use technology to provide students with real-world problems.
			Use technology in teaching to increase interactivity/collaboration among the students.
			Design lessons that require students to use electronic resources to access and retrieve information from a variety of sources, including primary sources.
			Design lessons that require students to use the Research Quest model.
			Design lessons that apply technology to help students visualize information and create patterns.
			Design lessons that apply technology to develop critical-thinking skills and creativity.
			Design activities that foster electronic collaboration.
			Design projects using technology to compile, organize, analyze, and synthesize information.
			Design lessons that require students to use a database and/or spreadsheet to collect, organize, manipulate, graph, and interpret data.
			Design lessons that require students to use a computer slide show to organize and present information.

5. Ethical use

N	I	A	
			Understand and follow the schools/school districts Acceptable Use Policy with students.
			Understand privacy issues as they relate to the Internet.
			Model ethical behaviour/acceptable practice when using instructional technology/electronic resources

Appendix 6 Pre-Planning Template

Guiding Questions	Reflections
Exploring a Focus:	
What excites me about my teaching? about technology?	
How am I currently using research and the research process in my classroom?	
What are some of the things that I would like to explore around technology?	
Where am I?	
What are my current ICT skills? What are the gaps I want to fill?	
What tools are available in my school?	
What are my learning priorities related to technology?	
What resources/support can I draw upon to learn on my own? For support in my school?	
Comments/Questions for my Mentor	

Appendix 7 Action Planning Template

What do I want or need to learn next?	
What is my immediate goal? How will this move me towards my long-term goal? What would be a logical time frame?	
How will I use this skill, strategy or tool?	
Where does it support the research process? How else might I use this? Is this going to be worth the time, energy and effort? How will this support, enhance or make new learning experiences possible in my classroom?	
What will success look like?	
What will I be doing differently? What will my students be doing differently?	
How will I assess my progress?	
How will I monitor my plan? What kind of data could I collect? What kind of feedback would be helpful from my mentor? What is working for me? Still a concern?	
What is my next step?	
Comments/Observations/Insights:	

Appendix 8 Critical Question Activity Part 1

Column A:	Column B:
Which has had a greater impact on the lives and economic development of the people of Pakistan and India during the 20th century; religion, politics, or colonialism?	What is Buddhism? Write a report that describes the important characteristics of Buddhism.
Which animal is more valuable to the survival of the Inuit; the caribou or the seal?	How are (polar bears, seals, ptarmigan) adapted to their habitat?
Your parents have been given an opportunity to move to Japan and can live in one of three cities. Which city would be the best choice for your family?	What is daily life in Japan like? Write a report on Japan that includes information on the geography, the climate, the people and family life, the history and culture, how people earn their living.
Of all of the environmental problems involving the Strait of Georgia, which one poses the most significant threat to the health of this marine environment and what steps would you recommend to eradicate the threat?	What is one environmental issue threatening the Strait of Georgia? In a report identify the issue, provide background that explains why it is an issue, and provide information on what is currently being done about the problem.
Which alternative energy source would be most suitable for development in your area if your local community wanted to become self sufficient in energy needs?	How do wind and solar energy compare and contrast? Share your findings in a written report.

Features of the questions in Column A:

1.

2.

3.

4.

5.

Appendix 9 Critical Question Activity Part 2

Identify which of the following are critical questions. Turn each of the remaining questions into critical questions.

1. If you could draw upon Hammurabi's Code to add one law to improve the Canadian legal system which law would you choose and why would it make a difference?

2. Which Internet search engine would you recommend for use by students in this school? Be prepared to share the criteria that you have developed to defend your choice.

3. Compare the construction of Viking ships with the construction of the First Nations canoes.

4. Design a travel brochure to advertise tours to your favourite planet.

5. Has civilization moved forward in our treatment of children as a labour source? Compare child labourers of the industrial revolution with child labourers of the modern developing world in making your decision.

6. Identify actions that would make a significant impact on preserving the environment of your local community. What action would you recommend and why do you think that it would make a difference?

7. You are building a new community in < insert name of specific region>. Which energy source would you choose to support this community and how would you persuade others to accept your choice?

8. How have polar bears been affected by the development of northern communities?

9. On the next mission to the international space station, NASA will take 10 experiments from schools across North America. Create an experiment that you feel should be included, and write a rational on why your experiment should be chosen for the mission.

10. Terry Fox, Sarah McLachlan, and Wayne Gretsky have been nominated for "all time Canadian" hero. Choose one person and write about their contributions to Canada.

11. How does the impact of logging compare with the impact of fishing on salmon survival?

12. If you could alter one event that led up to the Riel Rebellion to produce a more positive outcome for the Metis people, which event would you alter? How would this change the outcome of the historical event and what would be the long-term results of that change for the Metis people?

13. There is an island overrun with rats. You want to introduce a species to get rid of them. Which species would you choose and what would the long-term environmental impact of your choice be?

14. Which 15 places would you choose to include on an travel itinerary for a group of grade 8 students from British Columbia to provide a complete overview of the significant events, places, people, and accomplishments of Medieval times in Britain.

15. Is global warming a problem that Canadians should be concerned about? What actions should we be taking?

Appendix 10 ICT Integration Lesson Planning Template (two pages)

Grade Level:	
Subject Area(s):	**Lesson or Project Duration:**

OVERVIEW INFORMATION	
Title	
Curriculum Connections	What curriculum learning outcomes will be addressed in this lesson or project? How do these outcomes connect to real world applications and understandings?
Assessment and Evaluation	How will students demonstrate they have achieved the learning outcomes?
Effective and engaging learning experiences	What specific critical question(s) will be answered? What technology skills and/or goals will be addressed in this lesson or project? How does ICT support or enhance student learning? How will the research process be used in this lesson or project?
ICT INTEGRATION	
Technology Required	What software and hardware are needed for this lesson or project?
Skill Level	Novice Intermediate Advanced
Technology Focus	Literacy Adapting Transforming

LESSON OR PROJECT	
Student-Focused Activities	How is the lesson or project introduced? What activities will foster student engagement and ensure equitable benefits? What handouts/directions are needed? What opportunities will there be for students to make choices and decisions?
Student Assessment	How will student achievement of curriculum outcomes and technology outcomes be assessed? How will the expectations and criteria be clarified with students? Consider: ☐ Providing models/ samples of exemplary performance ☐ How will the assessment help students to self adjust and self-correct to improve future efforts?
Reflections	What would increase the quality of student work? How could this activity be adapted, modified or extended to meet the needs of all learners?

Appendix 11 Organizing and Managing the Classroom

Many of the classroom techniques and strategies used by experienced ICT mentors are subtle and difficult for novices to identify. The following suggestions were gathered from experienced ICT mentors to make some of these strategies more apparent.

Pre-Planning and Preparing

Being well prepared for technology activities will increase confidence, comfort levels and the likelihood that the efforts of teachers and students are successful.

- Check the computer lab before you take your class in. What machines are working, which ones are not? Which machines can access the Internet? Do you know the procedure for logging on and off? Do you have the necessary passwords to log on?

- Do a dry run before you bring the students in - make sure that what you are planning will actually work in the lab in the way that you have envisioned it.

- Become familiar with scheduling procedures for the computer lab or classroom computers at your school. Some schools make flexible scheduling possible where teachers can book the lab or library for short-term activities. Other schools make it possible for teachers and students to access unused computers in the lab at any time.

- Organize the lesson to maximize student involvement and independence, and minimize instruction. Review the instructional components in the classroom so that students know what to do when they go to the lab and can use their time more effectively.

- Support the process with written instructions (handouts or whiteboard) that students can refer to during the lesson.

- Two by Two. Teach two students the new skill. New 'experts' then teach two other students, and so on.

- Establish criteria for evaluating the content AND criteria for evaluating the technology skill or process. Many mentors comment on how easy it is to be distracted by superficial features that make the final product look very polished and can disguise the lack of content. Have your criteria well laid out and available to the students at the beginning of unit.

- Always have an alternate activity on hand that does not involve technology for those times when the hardware, software, or connections fail.

- Check all URLs you are planning to use in the lab - sometimes sites that you can access at home are blocked in the lab.

- PG -12 Rule. All sites accessed in the lab (any story, any graphic, and any website) must be suitable for viewing by any 12-year-old. Ask students, "Would you feel comfortable showing this item to me (the teacher), to your parents, to the principal?"

- Provide students with an outline or web page of starter links so that they can click on links rather than typing URLs.

- Prepare for Internet searches in the classroom by providing students with opportunities to identify keywords and phrases so their use of lab time is more efficient. Remind students to access a variety of sources to verify information.

- Show students how to correctly cite information. The standard rule is "If you can't cite it, you can't use it." This is true for information, music, and pictures from all sources, including the Internet.

- Teach the students to create a word-processed "template" that includes their name and the auto-date in the footer. Use this form for each new assignment.

Establish Policies and Procedures for the Lab

- Know and review with the students the Acceptable Use Policy (AUP) before they go to the lab for the first time.

  o Some schools have parents sign two copies of the AUP, one goes on file in the office, the other is a signed copy in the student organizer which is carried by the student and can be presented in any lab or classroom when requested by the teacher. Students without this permission are not allowed to access the Internet.

- Use a sticker on the student card or library card, which indicates parental permission to use the Internet. This card must be on display when the student is online in any school setting.

- Make sure that students are aware of lab policies BEFORE they go to the lab. Once the routines are established, make sure that they are maintained. Post policies in a prominent place and encourage students to review them.

- Have a routine for going to the lab. Some mentors suggest that students line up outside the lab and wait there to be invited in. Have a routine for exiting the lab. Mentors suggested "Chairs in, monitors off, mouse and keyboards left with the computer".

- Do not allow food, drinks or gum in the lab. Teachers are role models so this includes your coffee cup and sandwich.

- Leave time at the end of the lesson to print, log off, etc. so the students are ready to leave at the end of class - and the next class can come in on time.

- Consider having a seating plan. This is highly recommended by mentors for making more effective use of time in the lab. It also allows you to track any problems that happen in the lab.

- Place the most easily distracted student on the machine that is hooked up to an LCD display unit, as any wandering from the task is immediately evident.

- Seat novice technology users near more advanced students so they have an expert nearby.

- Use a buddy system in the lab. As students will often select their friends, the class can be divided into A's and B's. A's and B's do not work together, but take turns on the computer.

Problem Solving with Students

*   To encourage student problem solving, teach the F4 Policy -

    o   F1 = Use the Help Key

    o   F2= Rephrase the question in the help menu

    o   F3= Ask a fellow student who looks like they know what is going on for help.

    o   F4= Ask the Teacher

*   Suggest that students place a visible object on the computer, such as a Styrofoam or plastic cup or a laminated 'HELP' sign, so that the teacher can see at a glance who is having problems.

*   Teach students *how* to help others, not just solve the problem for them. For example, teach students to:

    o   Sit beside the person who needs help and ask them to explain what they did and where they ran into problems

    o   Show others what to do first, then observe as they follow the same steps with their own computer

    o   Keep it simple - small steps are easier to follow

    o   Ask permission from the person needing help, before touching their mouse or keyboard. This gives them ownership of the computer and the problem

    o   Use the UNDO command

Strategies for Getting the Attention of Students in the Lab

*   Have students turn their monitors off or turn their chairs away from the keyboard and monitor so that you have their full attention.

*   Ask students to make eye contact with you. "Keep at least one eye on me".

*   Ask students to place their hands in their laps when you are giving instructions if they are not able to keep their hands off the keyboard.

*   Have a routine for the first few minutes of class while students get settled and organized.

*   Have a "puzzle, problem or website of the day" on screen for students to work on for the first few minutes or during any down time.

*   Use the first 5 minutes for students to practice their keyboarding skills in an independent, self-directed activity.

Troubleshooting Tips for Teachers in the Lab

- Create basic troubleshooting posters and post in lab. When students have a problem they can read through the steps and try some basic things before calling on you. In some settings these are called "What if" posters. For example:

  o *What if your computer locks up or freezes? Give the computer two full minutes to complete the task that it is working on (clock time not estimated time) then, if it is still frozen, reboot the computer using the Three Finger Salute (CTRL+ALT+DELETE on a PC or Open APPLE +Option +Esc on a MAC).*

- Use felt markers to colour code cords and their connections. This makes it easier for teachers to check the power cord or connections as one of their first responses to technical problems.

- Make it a rule that peripherals are NOT moved from station to station. Keyboards, mice and monitors are not necessarily "plug and play" items. Moving them can create configuration problems in some computer labs.

- Train some students as 'official troubleshooters'. Students might earn career preparation credits for such activity if it is consistent with the goals listed in the Student Learning Plan for CAPP.

- Record problems so that these can be shared and tracked.

- Use Post-it notes to jot down problems with computers and leave them on computer for next class. Give a copy to your lab technical support person.

- Use a logbook in the computer lab for recording problems with hardware or software. It can be left on the teacher's desk so other teachers coming in to the lab can check quickly for the latest problems.

- Use In Service / Out of Service signs to indicate which computers need repair.

- Explore different software applications that can be used for back-up protection, to freeze screens or to monitor Internet activity.

  o For back up protection, investigate programs like *Deep Freeze* (for PC) and *Rewind* (for Mac)

  o For managing software, explore *MacManager*, *Syncroneyes*, *Apple Network Assistant*, *Virex*

Working in the Lab

- Circulate around the room rather than staying in one place so that you know what is happening.

- Stagger the times when students are going online. A whole class accessing the router at the same time can create a bottleneck.

- Ask students to demonstrate that they know how to do something properly. Sometimes students will overestimate their skills.

- Create student folders on the network so that work can be handed in electronically.

- Set up an intranet or use regular Internet email so that students can digitally contact teachers, access assignments or instructions that they have missed, and ask questions.

Printing

Printing can create big problems for teachers and students. It is helpful to have one set of rules that apply to all networked printers in the school. There are huge variations in school policies for the use of printers by students. Mentors suggest:

*   Have students 'Preview' before printing to make sure they are only printing what they need and are not printing blank pages.

*   Consider setting some rules for printing.

    o Should students ask before they print?

    o Are they allowed to print from the Internet?

    o Are they expected to pay for paper printed and left at the printer?

    o Is there a limit to the number of pages a student can print?

    o Should students be asked to supply one package of paper for the printer as part of their school supplies?

    o How should they check when something does not print so that the print queue does not become jammed with multiple printings of the same document?

    o Can students clear the queue in the print monitor?

*   Make sure printer has paper and is turned on. Teach students how to do this.

*   Turn off background printing

*   Have students place some object on the computer when they are printing as a signal. Only one item per printer to avoid jams.