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Teacher-Librarians and Teachers Using
Information Technology Through Collaboration

By

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Teacher-Librarians and Teachers Using
Information Technology Through Collaboration

Submitted by: Muriel May Crompton

In Partial Fulfillment of the Requirements for the Degree of Master of Education

Dr. Julia Ellis

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April 15, 2010

Dedication

This paper is dedicated to my wonderful husband for all his support over the years.

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Introduction

Information technology is changing the way students experience their education. With the introduction of new technologies, twenty-first century learning has taken on new and exciting directions. School libraries, more than ever, have become vital connections for implementing new technology-driven practice. Equipped with a variety of resources, including print and non-print media, the library is the natural environment for connecting middle and high-school staff and students with learning technology. As I consider how to use my passion for technology to inspire my colleagues, I am reminded of the steps I took to arrive at this point.

My Developing Technological Awareness

In high school, I was enthralled with computers. I fondly recall the school's mainframe computer, which was the size of a room; today the same technology is the size of a desktop computer. In my first computer course, I learned everything from the basics of computing—including binary code—to such futuristic considerations as microchip implants. At the time, the melding of science and computers sounded unrealistic to me, but also very intriguing. Hard science was not my forte; my interest was geared more towards the softer science of computers. When I applied for and was accepted into a computer program at a well-known college, I was excited to be part of the computing world. Then, my situation changed and I was unable to attend college. Still the desire to work with computers has always stayed with me. I ended up taking a different direction, a direction related to my other passion—books.

My Connection With Books

Because I was drawn to working with books, I took up the craft of bookbinding and studied under a bookbinder who had trained in England. I was surprised at the range and complexity involved with the craft, from medieval manuscript restoration to cover design. But I caught on quickly and soon progressed to training others in book restoration, passing on the skills I had mastered to other apprentices. My desire to learn more, to educate others, and to share my teaching skills to a wider audience led me to continue my education, earn a teaching degree, and, eventually, pursue library work.

Becoming a Teacher-Librarian

My love of books grew as I surrounded myself with books in a library. As a volunteer with the Sooke School District, I contributed to the creation of the first library for the 500 on-call teachers in the district. Later, when the district incorporated a universal electronic system for all elementary- and middle-school libraries, I assisted many libraries with the process of automating their collections. With my volunteering complete, I felt ready for my new role as teacher-librarian. As the teacher-librarian in a middle school, I was assigned the task of evaluating the current collection, weeding out dated or unsuitable materials, and then automating the collection; this daunting task took three years to complete. With the library materials in a more manageable state, I focused my energies on the out-of-date computer lab in the media resource centre. This was my self-directed mission, to upgrade the computer lab.

Technology Use at School

Technology use is increasing at my school with computers and technical support being implemented. I have been instrumental in updating the computer lab. My background in technology made me aware of the importance of having functioning computers. I completed a number of university courses in my undergrad program that related to computers, so I felt confident in operating a computer lab as well as teaching with it. But how was I to encourage teachers to use the computer lab and utilize my expertise as a middle school teacher-librarian? My first step was to approach my school's principal.

I am fortunate that my principal supports a flexible library schedule that allows for team teaching with the teacher-librarian. However, I am also concerned that there is little history of collaboration between teachers and teacher-librarians in my school. Many teachers use print texts, and technology has not been readily implemented across the curriculum. I have contemplated why this is the case.

Teachers at my school have not had positive experiences using the computer lab. When the computer lab was in its previous dilapidated state, the computers would regularly crash, work could not be saved, and students outnumbered operational computers. Even though the school has a high-speed Internet connection, the old computers did not work well. Clearly, an upgrade was essential. After the computer lab was eventually upgraded, I turned my attention to the rest of the school computers.

To make technology an everyday part of teaching, computers need to be available and functioning. I teach in a school district that is not technologically advanced. When British Columbia moved to an electronic, web-accessible organization system for

attendance, scheduling, accounting, reporting, and student records, the inadequacy of our technology was made abundantly clear. Our school didn't have computers that could run the provincial system efficiently. Since updating our school computers, we now have computers on every teacher's desk. The availability of a support person increases the likelihood of technology being used effectively in teaching.

To ensure technology is implemented properly, it is important to have support staff in place. This year, the Sooke School District hired a technology curriculum coordinator—the first in fifteen years. Now with the computers in place for the teachers, a functioning computer lab, an automated library collection, and a district resource person, I feel ready to work on bringing technology into lessons at our school.

The Teacher-Librarian Role Regarding Technology

The teacher-librarian plays a key role in incorporating technology into the curriculum. My teaching takes place mainly in the computer lab, but having a functioning computer lab does not mean it will be used efficiently. As a teacher-librarian, my role is to support teachers as they learn to utilize the computers, helping them develop their technological skills. I found a hands-on approach to be the most effective way to encourage teachers to use technology in their teaching. I used this approach to introduce teachers to a program called Inspiration and shown them how to use this graphic organizational tool with their classes. This has been my starting point to introduce technology to teachers, but I realize more needs to be done.

Gaining Inspiration from University Technology

Through my Teacher-Librarianship program, I have become aware of the important role that teacher-librarians play in technology implementation. In particular, the intensive Exploration of Web 2.0 course addressed learning through collaboration. I was so excited about the Internet opportunities I learned about in this course that I created ten lessons using Web 2.0 tools to share my knowledge with my colleagues and offer them practical experiences with social media. I had planned, along with my principal, to present these short, introductory lessons at monthly staff meetings. Then, I would offer professional development via in-servicing and small-group sessions after school hours. My exuberance was cut when my principal asked me not to present this information at staff meetings. At that moment, I realized that the staff did not share my passion for technology-driven lessons. I needed to come up with an alternative plan for bringing technology into the classrooms. I decided the only means to integrate digital technologies into classroom teaching was through active collaboration.

Enhancing Technology Use through Collaboration

A teacher-librarian does more than sign out books and maintain a computer lab. My multifaceted role includes working collaboratively with teachers, incorporating information technology into the curriculum, and being an agent of change. It is in this last role—as an agent of change—that I ask myself how to move forward with implementing information technology into the learning environment. How can I convey the importance of technology-based teaching to my colleagues?

Information technology can be empowering for students and staff. I often see students enjoying the extra time spent on assignments with a technological component.

With collaborative work, I've seen students engage in dialogue, discuss processes, and consider how to use technology to enhance their projects. Students are technologically savvy; they've grown up as digital natives. But I need to inspire teachers to willingly try new technology. I plan on working together with teachers to integrate technology into classroom instruction. How can I foster this collaborative opportunity with teachers?

To increase the use of technology in schools, it is crucial for teacher-librarians to make connections with teachers and students. As a technology leader, my expertise can enhance the collaborative aspect of my teacher-librarian role and bring teachers and students closer together in the technological world. If I want teachers to participate, I need to give them hands-on experiences and opportunities.

My practical experiences have provided me with the background I need to implement technology within the school setting. By using networking tools such as list serves, online forums, and RSS (real simple syndication) feeds, I can support teachers so they can seamlessly adopt, adapt, and create lessons that are technologically engaging for students. It is important for me to pursue my quest to engage teachers to implement technology in their teaching. How can I develop a collaborative relationship to ease the transition and build teachers' confidence in using information technology in their teaching?

To accomplish my intentions of incorporating technology through collaborative teaching, I propose to examine literature related to implementing information technology through collaboration. The sub-topics I've used in the literature review include: importance of information technology, understanding collaboration, and fostering collaboration between the teacher-librarian and teachers.

Literature Review

Importance of Information Technology

In the twenty-first century, learning *must* include a digital aspect. Books are no longer the only place to find referenced materials; knowing how to access information via the Internet is integral to meeting curricular standards. Swan (2000), in a K-12 American study addressing electronic literacy standards, stated that in order for students to become information-literate learners, incorporating technology into the classroom was essential. How are the different perspectives related to student literacy?

Defining Information Technology

Information technology is a broad term that refers to gathering, accessing, and using information with the assistance of some form of technology. Information technology includes both digital information and communication technologies. Harris (2005) describes information technology as “environments in which people use communication technology to access information, manipulate it, transform it, and exchange it” (p. 34). This description, however, doesn’t cover the interactive quality of information technology, which is emphasized by Johnson (2006). He notes, “telecommunications [are used] to collaborate, publish, and interact with peers, experts, and other audiences” (p. 220).

Importance of Information Technology in Education

Today’s educators use technology to access information with increasing frequency. Teacher-librarians play an important role in this trend, supporting teachers as

they learn about information technology. Gerding (2007) states, “Technology offers unprecedented opportunities for critical thinking, information sharing, information access and social networks” (p. 18). These activities are fundamental aspects of student learning, making information technology an essential component in education.

Some educators may hesitate to embrace technology in the classroom, fearing their students will obtain inaccurate information. Todd (1998) agrees that there is plenty of misinformation. The key is teaching students the skills to tap into the accuracies of valuable sources. Students with poor Internet-literacy skills have not learned how to evaluate the results of keyword searches. Teachers need to “teach this generation . . . how to use electronic sources effectively” (Combes, 2008, p.16). Students will learn to implement information technology properly if they are taught the necessary skills.

Information Technology Skills

Using technology to effectively access relevant information is a learned skill. When students learn how to assess and evaluate the information they find on the Internet, they are learning skills that they can use throughout their lives. “Information literacy provides students with the knowledge and skills to efficiently and effectively access information, while accurately evaluating and assessing the information they receive from any source, particularly the Internet” (O’Sullivan & Scott, 2000a, p. 41). By understanding and practicing these basic skills, learners will be able to develop their expertise as technology users.

Students need to learn many technology-related skills, including being able to

- Identify the source of the information
- Determine the validity of the information
- Consider whether the information is authentic and relevant to their needs

- Display information retrieval proficiently
- Analyze the information
- Communicate the information to others

Johnson (2006) reminds us that students need technology skills in their day-to-day lives. He also acknowledges that these skills are only one aspect of the information problem-solving skills and higher-order thinking skills that are required today. As technology users, students are continually developing these important skills.

Using the Internet as an educational tool can be empowering for teachers and students. Users need to learn the valuable skill of properly researching topics online. O'Sullivan and Scott (2000a) discuss research tools that can be used to incorporate information technology into student research. The skills students use to evaluate web sites can be applied across the curricula. As well, the practical application of technology provides the foundation for teachers to gain confidence in teaching these strategies. Information literacy, judging Internet information and effective research strategies are all critical skills that can be used extensively by students, benefiting them today and for years to come. Teachers and teacher-librarians can assist students as they develop these skills.

Teacher-librarians can support teachers as they teach students how to assess the value of their research—whether in print or digital forms. A trained teacher-librarian can provide background information and teach skills that can then be used to recognize quality information. “The main problems in evaluating information lie in the difficulty of assessing the credibility and originality of information and the professional integrity of the presentation” (Eshet-Alkalai, 2004, p. 99). Accessing quality information is essential but knowing how valid it is to a particular assignment is also important.

How are students taught to determine the value of information? Richardson (2005) writes that students need to know how to identify the source of the information, how to determine its validity, and how to decide whether the information is authentic and relevant to their needs. This can be done by critically questioning the legitimacy of the information that has been retrieved. The Internet is more than just a place to find, cut, and paste information. To transfer information technology to daily life, higher-level skills are necessary.

As life-long learners, students transfer the skills they learn in one class to other classes or other aspects of their education. Classroom teachers, as well as teacher-librarians, assist them in applying what they've learned to a variety of situations—both in school and out of school. In some situations, the teacher-librarian has more practical expertise with information technology than classroom teachers. Asselin (2005) suggests that teacher-librarians are leaders in the new literacies of the information age. In this role, their task is to ensure that “students are prepared to participate in a global, networked information society” (p. 37). Since not all teachers have Internet access on their classroom computers, the school library is often the place for more assistance.

Importance of the Library Centre

At many schools, the library is home to the school computer lab, and teacher-librarians assist students in accessing information through technological means. Loertscher (2003) discusses the importance of obtaining information from digital libraries. He suggests that teacher-librarians can assist in accessing vast amounts of information, ensure students have access to the Internet at school and web-based access when not in school, and use the budget to acquire more for less. The teacher-librarian

manages this information, making it available to teachers and youth. While classroom teachers have expertise in specific subject areas, teacher-librarians have expertise in the technical realm of information technology.

Youth and Thinking Differently About Information Technology

The digital environment requires its users to approach reading and researching in a new way. When we read a book, we start at the beginning and read from front to back, but the Internet is not linear. Acquiring information by using technology requires complex skills. Berger (2007) suggests that learning in the digital medium involves technical, cognitive, social, and emotional skills. Comprehending this new format involves graphic literacy (i.e., the ability to think visually), Internet-navigation skills, the ability to contextualize in order to make connections, higher levels of critical thinking, and an ethical understanding of cyberspace. Through these new ways of thinking, youth will understand the value of making connections between different aspects of their education (Berger, 2007). Obtaining information through technological means empowers all learners, although the thought processes involved may differ.

Teachers, teacher-librarians, and students all approach information technology with different intentions. Young people apply an interactive approach to Internet use. Tapscott (2009) conducted a qualitative online questionnaire with 10,000 young people, aged 13–20, from the United States and Canada. He refers to this group as the “Net Generation.” He found the mindset of this group differed from older generations, like their parents and teachers, because their brains processed information differently. When using the Internet, the Net Generation was more innovative, collaborative, and interactive—traits that directly affect social networks (Tapscott, 2009). To connect with

this generation is to understand how they think and to be able to assist them in their learning.

The teacher-librarian may be keen to master these new skills, but how does one inspire the reluctant teacher? The best advice is to keep it simple. Don't take on too many new projects at once, as this may prove overwhelming to the new technology user.

Duhaney (2000) discusses the feelings of fear that accompany many teachers' attempts to adapt technology for the curriculum and suggests allaying these fears by interspersing new strategies with familiar ones. Spending time online also helps learning in this environment, both in terms of understanding and connecting with students.

When teacher-librarians take the time to connect with students as they develop technical skills, they contribute to student cognitive ability. Eshet-Alkalai (2004), in an international empirical study involving 30 high school and adult participants, he examined how the expectations allowed individuals to be technically astute, show cognitive abilities and utilize sociological skills as they "perform[ed] tasks and solve[d] problems in digital environments" (p. 94). By sharing an interest and taking the time to experience the development of cognitive thought, the connective element to learning is validated. When teacher-librarians teach staff and students the critical thinking skills needed to navigate their way through cyberspace, learners develop an authentic approach to conducting research and learning online.

The teacher may embrace critical thinking skills, but the student masters them. The digital realm requires the learner to be at the forefront of online competencies. If educators insist that learners come first and that teachers and administrators build digital literacy skills into the core curricula, then educators can see how "librarians should

embrace the crucial role . . . in guiding Digital Natives through the increasingly complicated world of digital information” (Palfrey & Gasser, 2008, p. 253). The complex digital environment continues to develop; therefore addressing the tools needed is paramount. Students use interactive tools on the Internet; as educators, we need to understand and use these tools, too.

Web 2.0 Tools

The Internet continues to change, with online tools continuously under development—the Web is here to stay. Web 2.0 (also known as the read/write Web) focuses on interactive, rather than information-seeking, tools. Richardson (2005) and Valenza (2006) speak of a paradigm shift in the way we teach information technology. Teachers need to embrace this change and use the information available to them in the Web 2.0 environment. By joining a teacher listserv, teachers can correspond with other teachers to discuss how they use Web 2.0 tools to enhance the curriculum. This give-and-take environment signals a fundamental shift in the way teachers can communicate and connect.

Other Web 2.0 tools that teachers can use include blogs, wikis, and podcasts. These Web 2.0 tools provide new ways of communicating, collaborating, and sharing information with authentic audiences. By connecting with other individuals using these tools, students enhance and extend their learning network. Interactive blogging, for example, incorporates technology into learning and should be on “the list of top 10 online activities” (McPherson, 2006a, p. 154). He suggests introducing students to new Internet communication technologies while also providing opportunities for teachers to help students develop basic skills. As well, he acknowledges the role teacher-librarians play in

helping students develop their critical thinking skills (McPherson, 2006a). Teachers and students can gather information from wikis, contribute to them, or create their own with support from the teacher-librarian. Podcasts are excellent resources for a couple of reasons. They take the focus off the teacher and present students with the opportunity to learn from experts in the field. Whether teachers or the teacher-librarian assist students with accessing Web 2.0 tools, students will benefit immensely from making these interactive connections.

The evolution of the traditional, static web site into the interactive Web 2.0 format represents a necessary technological shift (Greenhow, Robelia, & Hughes, 2009). By engaging digital native learners through the interactive nature of the read/write Web, users participate more fully in the technology experience. These changes to the way the Internet is used mean new skills need to be developed to operate in this environment.

Application of Web 2.0 Tools

There is a gap widening between teachers, who know little about Web 2.0 tools, and students—who do. To ensure that students are making full use of Web-based resources, educators need to learn to use Web 2.0 tools to teach their students. Palfrey and Gasser (2008) suggest, “Teachers need to start putting in the time it takes to understand how the digital environment works so they can be credible guides to young people” (p. 100). Interactive online environments are affecting young people in astounding ways. Abram (2007) says that Web 2.0 will transform the way we interact on a global scale. As the Internet offers more opportunities for higher levels of interactivity, educators who incorporate these changes into everyday teaching will make the difference for students.

By using digital technologies regularly, teachers will be able to understand, teach with, and share these universally accessible Web 2.0 tools. However, simply having the tools available doesn't mean a user has the skill to operate them in the online environment. According to Valenza (2006a) students are not making full use of the online environment, as they "spend much of their time searching and little of their time analyzing and evaluating" (p. 227). Students using the trial-and-error approach will meet with little success.

Many educators believe that Web 2.0 skills are intrinsic in youth. They believe students, because they grew up surrounded by technology, are tech savvy, but they are not. Students may have a great deal of experience online, but they often do not know how to efficiently find information on the Internet. Adults are the primary audience for the Web; it is devoid of indexing and search standards, and offers users little support (Valenza, 2006a). While students may be passionate about communicating using Web 2.0 tools, teachers and teacher-librarians need to guide them to use this new media more efficiently.

By learning how and why Web 2.0 tools work, teachers will be better able to support students as they learn to use these tools properly. But teachers require techniques to assist them. Hauser (2007) provides examples of Web 2.0 activities that can be applied to the school setting. She outlines eight-step processes for using blogs, wikis, and podcasts. The goal of the activities is to engage all parties involved in communicating, collaborating, and sharing information. With so much new information available online, how does one keep informed about the multiple changes occurring?

To keep abreast of changes to Web 2.0, time has to be spent online asking questions, searching out answers, and being an active learner. Valenza (2007) discusses blogging and its importance in administering a constructivist approach to learning in a Web 2.0 environment. This environment inspires reflection and focus on the process, helps learners organize and manage their work, and encourages interaction, and builds social knowledge. Before these skills can be applied to classroom teaching, the background to information technology must be addressed.

Incorporating Information Technology into the Curriculum

The guiding principles for integrating information technology into the curriculum are found on the Partnership for 21st Century Skills (2009) website, in the section on Information, Media and Technology Skills that addresses ICT (Information, Communications and Technology) literacy. Educators are encouraged to use technology as a tool; use technologies to communicate, manage, evaluate and create information; and apply ethical issues in accessing information. These fundamental skills are necessary to function in a technology-based system.

Technology to Assist in Deeper Thinking

When technology is integrated into the curriculum, students develop deeper levels of thinking. Their range of knowledge extends beyond basic computer skills to engaging in online interactions to utilize information technology. McPherson (2006a) suggests that, by using web sites and Web 2.0 tools, students will move from typing, editing, peer editing, spelling, reading, and writing to develop critical thinking skills. These tools alone are meaningless unless they are associated with the curriculum.

The quality of a student's education improves when teachers introduce specific skills into the curriculum. By integrating information technology into the curriculum, students learn and refine transferable, purposeful skills. Greef (2007) raises concerns about plagiarism and the cut-and-paste nature of society today, but these concerns can be addressed by teaching students higher-level thinking skills such as comparing and contrasting, taking an unusual angle on a topic or question, and directing students to accurately record reference information. As well, copyright issues can be addressed by using material that is covered by creative commons copyright.

Teaching through discussion and hands-on activities can also take place. Creative commons licensing allows information from the Internet to be freely used. Discussions can revolve around the thinking behind particular restrictions. Free material is not appropriate for all learning situations, as research also requires practicing effective documentation skills. As well as considering the research aspect of information, educators need to ensure information technology is presented in useful and appropriate ways.

Applying Information Technology in Education

Educators need to carefully plan for the way they use information technology when they teach. The unsuccessful "add-on approach," for instance, often surfaces in teaching technology. Glazer, Hannafin, and Song (2005) use Glazer's term "just-in-time teaching" to explain that "effective technology integration requires teachers to obtain learning experiences within the context of their teaching so they can practice, reflect, and modify their practices" (p. 57). The timeliness of the strategy is important as it shows

realistically how technology can be implemented into teaching. These teachable moments can be applied to many subject areas, along with the transferability factor.

The ability to transfer skills from one experience to another is an important component of teaching technology. Technologies can have a widespread effect on learning. McPherson (2006a) emphasizes the importance of ensuring “students develop an adequate width and breadth of information literacy skills across the variety of information formats” (p. 146). By developing transferable skills, students are more likely to experience success with information technology. These ideas are particularly applicable in the Humanities field.

Information Technology in the Humanities

Information technology can be used to support a range of curricula. Let's consider the English classroom to be the venue. The Internet provides students with instantaneous access to research, interactive discussions, and answers to their questions. Kajder (2003) professes, “The Web, when harnessed effectively, has speed and currency on its side, whereas school and local libraries often do not have current materials and are more difficult for students to navigate” (p. 50). However, students need to be taught how to accurately navigate the Internet in order to find the online information they seek.

Using basic strategies taught by classroom teachers or the teacher-librarian accesses much of the information on the Internet. Kajder (2003) provides teachers with suggestions intended to encourage successful Internet experiences for their students. She suggests that teachers survey students to assess their experience with the Internet, review URL identification, discuss search engines, and conduct Internet searches using different

strategies. Once students have learned these techniques, they are ready to learn more complex skills.

Simple keyword searches will not always get students the results they are looking for because some material is located on the invisible or deep Web. These sites are not indexed by search engines and therefore cannot be accessed using traditional means. “Deep Web sources store their content in searchable databases that only produce results dynamically in response to a direct request” (Kajder, 2003, p. 59). The invisible web contains sites that house images, articles, and primary source documents. Students can be taught practical, strategic skills to obtain this hidden information. These skills can also be applied outside of the classroom.

Transferable Information Technology Skills

When educators provide multiple opportunities to use technology in the classroom, their students will also experience success with the Internet when they aren't in school. Lamb and Johnson (2007) share strategies for integrating technology into the curricula, such as collaborative writing and learning for problem solving, conducting research, creating electronic portfolios, using study guides, and conferencing. These activities can all be used in and around the community, too.

Bridging the gap between school and home allows for more successful digital integration. Harris (2005) surmises that teaching out-of-school content promotes life-long learning. By broadening the scope of in-class material, students have more control over their learning, making it a deeper and more fulfilling experience (Harris, 2005, pp. 115–116). Using information technology in the classroom can enrich the learning experience, but there is so much more to consider when utilizing the interactive Web.

Development of Information Technology in the Classroom

The interactive element of the Internet appeals to youth. Asselin (2001) contends that there is a relationship between literacy and technology. Some school assignments that involve technology include class and school web pages, e-pals, and projects created from and posted on the Internet. “The value of educational time spent on using technology to support students’ literacy development rests on its ability to promote higher level thinking, collaboration, constructivism, speed and information evaluation” (p. 50). Technology serves a twenty-first century competency that cannot be completed in any another way. There are multiple opportunities to include a digital component in teaching.

To keep pace with rapidly changing technology that students can benefit from, is a daunting task. Many students are more familiar with digital technologies than their teachers. Gerding (2007) generalizes that educators are often placed in a teaching situation that they haven’t been trained for. She reminds us that it is better to be a teacher and learn about information technology than to be a technician trying to teach others. The key for teachers is to go online, keep current, and share resources. Teacher-librarians contribute by collaborating with teachers, using technology effectively, and showcasing the teachers’ work.

To truly share the work of teachers and students, teacher-librarians must take an active role using the Internet. Richardson (2009) and Valenza (2006b) identify a paradigm shift in the leadership role for information technology. Richardson insists that teachers must approach the technological divide with fervour and not continue to fall behind students. Valenza (2008) writes that the teacher-librarian can assist teachers in participating in the electronic-learning environment and share many useful applications.

She directs attention to the global audience, copyright use, web-based applications, technology for teachers, and new strategies for gathering information online. Obtaining the knowledge of these tools will build practical skills. One way to encourage teachers to use information technology in the classroom is to work collaboratively with them.

Understanding Collaboration

To understand how teachers and teacher-librarians might collaborate, a number of collaborative techniques must be considered. Collaboration involves the dynamics of a teaching relationship between the teacher and teacher-librarian where interactions are fluid and modifications are based on continuous assessments of student need and performance (Doiron, 1999b). Haycock (2007) emphasizes the importance of students in this process when he says that collaboration is the “single professional behaviour of teacher-librarians that most affects student achievement” (p. 34). By looking at the technological aspect of collaboration, the connection between student success and the teacher-librarian’s role as collaborator becomes clearer.

The Collaborative Process

To successfully integrate technology into the curriculum, the teacher and teacher-librarian must consider a number of factors. These factors include knowing the participants, understanding the connection between the teacher and the teacher-librarian, applying deeper levels of thinking, actively engaging the participants, and using the collaborative process within the context of the lesson. Ruffin (2006) explains that many parties benefit when technology is included in the collaborative process: teachers, teacher-librarians, administrators, and students. The process involves planning meeting times, following a format, planning how the collaboration will proceed, and measuring its

success. As teachers and teacher-librarians sit down to discuss their strategies, the goal is to benefit the students. Asselin and Lee (2002) also state, “Teacher-librarians’ expertise in information literacy and technology instruction rests on carefully planned experiences connected to the classroom” (p. 16). Connections need to be made with colleagues as well.

The participation of individuals is fundamental to the success of the collaborative process. Start with a colleague you work well with and trust. Montiel-Overall (2005a) provides a comprehensive explanation of teacher-librarian collaboration. She emphasizes the importance of creating trust among the participants and involving two equal participants to share the thinking, planning, and creating of the integrated instruction. With the material presented differently, one aspect being a technological component, students are engaged more completely.

Student understanding is accelerated when information technology is a part of their learning environment. Asselin (2005) examined factors that support information literacy instruction in the areas of information retrieval proficiencies, analysis, and communication via expert technological skills. Asselin conducted a Canadian study involving 300 students from grades 6 and 7. She found collaborating with information technology designed assignments encouraged higher-level thought processes such as critical thinking and the ethical use of information. Using collaborative strategies and utilizing technology, in all subject areas at the middle-school level, the cognitive development of students was reinforced. The benefits of collaborative study is empowering for educators and students alike.

Collaborative application allows students to think more deeply about the subjects they are learning. Montiel-Overall (2005b) argues that collaboration develops critical teaching, thus producing critical thinking on the part of the students. Todd (2005) also reiterates how instructional collaboration between teachers and teacher-librarians allows students to achieve higher levels of literacy, problem-solving, and technology skills. The quality of these skills deepens the knowledge and understanding of the topics studied. The successful results show the effectiveness of collaboration by all parties involved in the learning.

Through collaboration and sharing, teachers and students are actively engaged with the learning process. The inclusion of technology creates a more rewarding learning environment. “Using Web 2.0 tools can make work more fun for adults and learning more interesting for students” (Hauser, 2007, p. 6). The skills are more likely to be used and encouraged as students take ownership of their learning by using metacognition, reflection, and assessment components.

Collaboration has a direct impact on student achievement whereby the lessons are meaningful and effective; they are taught within the context of the existing curricula. For students to embrace new information technology skills, these skills should be taught jointly with teacher and teacher-librarian (O’Sullivan & Scott, 2000b). A movement toward collaborative relationships between teachers and teacher-librarians will make the difference in student success. To balance the teaching styles of a teacher and a teacher-librarian is essential, and the strength of each teaching technique lends to its success.

Collaboration and Information Technology as a Teaching Strategy

Technological innovations are becoming more complex, so teachers will need assistance with integrating technology into the curriculum. If teachers can see how technology can be implemented, they will be more willing to utilize the collaborative component to accomplish their learning goals. Moore-Hart's (2008) collaborative teacher-research model increases student literacy by improving the ways teachers integrate technology into the curriculum. This American qualitative study, which focussed on elementary students, revealed that the multimodal tools of technology stimulated student literacy by allowing for problem solving opportunities and developing their language, creating higher-level thinking outcomes. Technology engages students in an interactive format.

To engage students, use interactive digital technologies. Valenza (2006a) explains why teachers need to involve students in their learning and how online opportunities will support this approach:

[W]e must also collaborate to create research challenges that allow student choice, projects that are authentic and that motivate learning. We can use authentic tools in the Web 2.0 environment. Wikis can support students' group projects. Blogs can support student journaling and reflection. (p. 230)

A variety of options are available for teachers who want to integrate technology into the curriculum. Teachers and teacher-librarians can work together to decipher the options that will work best for them and their students.

The excitement of using a collaborative approach comes at a cost. Successful collaboration involves homework. For teacher-librarians to successfully collaborate with

teachers, they need to do their homework on the process (Bush, 2003; Loertscher, 2006; Montiel-Overall, 2006). Teachers, whose time is already stretched tight, are reluctant to add to their workload; therefore, the teacher-librarian may be required to do much of the initial work. This work should be undertaken with the realization that the higher-order thinking skills that the students will gain are offset by the time commitment required (Toor & Weisburg, 2007). For collaboration to work, the educators involved must be committed to the process. By providing both new and experienced teachers with hands-on opportunities, the teacher-librarian provides a venue for building success.

Fostering Collaboration Between the Teacher-Librarian and Teachers

There is no single way to achieve success regarding collaborating in teaching. A number of different strategies can result in positive collaborative experiences. Todd (2008) conducted a study of 154 public school libraries in the United States, asking for the amount of instructional involvement in the state's core learning standards. When comparing cooperative lessons with collaborative lessons, the study found that 25% of elementary schools used a collaborative approach to planning and teaching curriculum units. To counter this low number, Todd focused on devising instructional collaboration techniques, such as planning, working together to find solutions, having clear expectations, and reflecting on the success of particular lessons. By incorporating these practices into their planning, teachers provide the best learning opportunities for the students. By understanding the collaborative conditions allows teachers to share in the possibilities of student success.

Collaboration is a multifaceted enterprise with numerous permutations. To succeed with collaborative teaching endeavours take small steps, support one another,

and remember that students in a collaborative environment learn at a deeper level. Some authors suggest that collaborative relationships will thrive if those involved start small and find success before moving on (Hickel, 2006; Toor & Weisburg, 2007). Motivation can be infectious as presented by Casey and Savastinuk (2007); these authors motivated by getting people to buy-in to using information technology in libraries. Using an inquiry approach that utilized collaboration, Harada (2005) researched the ways librarians and teachers reshape their practices through collaboration to include assessment and reflection. This inquiry expertise and sharing incorporated a wider sphere of knowledge by using the Internet to deepen the understanding of the topics developed. The collaborative process involves a variety of approaches to teaching, allowing teachers and students the opportunity for deeper thinking. In order for students to benefit from a collaborative process, teacher-librarians ought to encourage the practice.

Encouraging Collaboration in Teaching

Collaboration will only occur if teacher-librarians encourage it. Asselin, Branch, and Oberg (2003) state that students become information-literate when “teachers and teacher-librarians work together to develop an instructional program that ensures that information literacy outcomes are integrated into student learning experiences in a developmental and sequential manner” (p. 57). Planning is an essential component of the process and ensures both the teacher and teacher-librarian deliver instructional elements.

Support for the collaborative process can occur throughout the day to encourage participation. A descriptive three-fold process involves the teacher and teacher-librarian working together, a supportive principal providing flexible scheduling, and collaborative planning time that takes place during the school day (Farwell, 1998; Montiel-Overall,

2005a; Montiel-Overall, 2005b). These principles assist teachers in realizing the importance of teaching collaboratively. Teamwork, according to Greef (2007), provides a process which links to the deeper cognitive abilities of students through the use of higher-order thinking skills. Tying these successes together with the technological component provides an ideal learning scenario.

Direction of Incorporating Information Technology in Schools

When teacher-librarians implement technology in teaching, they approach the task using a number of ways. Moore-Hart (2008) discusses how the educational system can help teachers acquire the expertise to use computer technology and to integrate technology with the curriculum. Technology is considered a tool that will make their job easier. “Teachers become willing to integrate technology into the curriculum when they see how it can be used as a tool to accomplish their learning goals and to promote student learning” (Moore-Hart, 2008, p. 179). To make the transition as smooth as possible, teachers can choose from a number of ways to incorporate technology into the classroom.

Resources exist for teachers and teacher-librarians that describe a variety of technology situations in schools; the explanations show how schools can move forward. By using multimodal technology tools, consider the technological environment that stimulates literacy learning. Being aware of “opportunities for problem solving, language use development, and higher-level thinking” (Moore-Hart, 2008, p.196) that evolve naturally, teachers are given numerous opportunities to incorporate technology into teaching. As they do so, they need to remember that technology is not *added*, but *incorporated*.

Technology for technology's sake will not benefit teachers or students. To benefit the learner, technology needs to be "an integral part of the curriculum" (Doiron, 1999a, p. 351). Doiron reminds us that, to succeed, technology is to be used as part of the instructional program. Tapscott (2009) takes this idea a step further, suggesting that technology needs to be student-focused, customized for the learning environment, and collaborative. By fully incorporating technology into the curriculum, students benefit most. A collaborative approach to using technology will improve students' critical thinking abilities, a skill that students will use throughout their lives. Sharing the technological tools within the teaching environment are enriching for everyone.

Many electronic tools are available to teachers, and they are changing rapidly. To ease the transition to these new technologies, teachers can address familiar topics in the digital arena. Valenza (2006b) suggests moving into the information technology age by accessing a number of resources, organizing information so it is readily available, networking with others to share the learning, and choosing professional development opportunities that focus on technology. Making the time to learning about digital technologies can have profound results.

Collaboration with Web 2.0 and Support from Teacher-Librarians

When teachers learn that a collaborative approach to using technology provides students with a positive learning experience, they will be motivated to apply this approach with their students. A project at the University of Alberta, in Edmonton, focused on encouraging teachers to gain experience with Web 2.0. This Web 2.0 in action was presented by de Groot and Branch (2008) and used technology in the classroom with teacher-librarian support. In this qualitative study involving teacher-librarian students, de

Groot and Branch put teacher-librarians in the position of learning about Web 2.0 through practical experiences. To avoid being overwhelmed by the all of the information available via the Internet, a blog was created, providing a forum for teachers, teacher-librarians, and students to collaborate. The Web 2.0 interactions took place online, creating learning opportunities with technology to be utilized in varying degrees to support everyday teaching. The study found that hands-on experiences with technology heightened user awareness and skill with interactive technology, making the learning applicable and realistic. The practical application of the technology provided teachers with the experience they needed to apply these skills in their classrooms. This type of practical collaboration has long-lasting results and is ideal for the teaching environment.

Including Web 2.0 in the learning environment benefits today's learners by creating connections between learners and between teachers and learners. Online interactions offer a range of learning possibilities, as computers provide a "matrix of collaboration, technology, and leadership" (Milbury, 2005, p. 30) that increases student achievement. Milbury notes that librarians are trained to search, organize, display, and present information efficiently. By using these skills in the collaborative process, librarians encourage students to think critically and to synthesize information with appropriate acknowledgment. No matter how information technology is integrated with teaching, the commitment of the people involved makes collaboration work.

Collaboration and Integrating Information Technology

Successful learning experiences rely on putting the learning to practical use. Meyers and Eisenberg (2008) argue, "Information literacy skills are becoming increasingly important to life-long learning and success" (p. 13). The practical side of

learning allows us to “develop ways of delivering credible, relevant, useful information to students that they can easily access and incorporate readily in their work” (p. 13).

Collaboration validates technology as a teaching tool that can be applied to different situations. Todd (2005) observed, “Instructional collaborations result in students achieving higher levels of literacy, reading learning, problem-solving and technological skills” (p. 2). These usable skills contribute to the higher-level thinking skills required to succeed in society today.

Creative thinking and a collaborative demeanour are qualities that will serve students well throughout their lives. By using collaborative strategies in the classroom, teachers become collaboration role models for their students. For example, Granger, Morbey, Lotherington, Owston, and Wideman (2002) examined four Canadian schools to discover factors that contributed to successful integration of information technology in classrooms. When students worked collaboratively, the skills that teachers displayed were transferred to the students. The students then performed tasks with autonomy and confidence. The study also found that information technologies contributed significantly to a learning environment that promoted skill acquisition and curricular integration. Through this stance teachers and teacher-librarians achieved a balanced approach to using technology to improve teaching and learning for both teachers and students. The study found that tasks, tools, and time were necessary to support teachers as they integrated technology into their instruction. Incorporating discussions about technology into the classroom would not be complete without an online component.

Collaboration allows teachers to incorporate technology into today’s connected society. Greef (2007) suggests developing online library web sites to access information

resources. When students develop the ability to effectively explore the Internet, they will gain a deeper understanding of the topics they are studying. By applying collaborative strategies that use technology, teachers ensure that students can successfully implement new learning.

The more reliable the results, the more effective the practice will be for teachers and students. Research suggests that, to make the transition to using information technology comfortable for teachers, collaboration is key (Glazer & Hannafin, 2008; Gerding, 2007; Hauser, 2007; Glazer, Hannafin, & Song, 2005; Hughes & Ooms, 2004; Seels, Campbell, & Talsma, 2003; Jenson, Lewis, & Smith, 2002). When teachers and teacher-librarians work together to ensure the learning environment includes a technological component, students benefit. Asselin (2001) eloquently sums up the situation: “The value of educational time spent on using technology to support students’ literacy development rests on its ability to promote higher level thinking, collaboration, constructivism, speed and information evaluation” (p. 50). Success comes from starting small and building upon proven collaborative examples. By gathering information using technological means, the teacher-librarian becomes an agent of change in the metamorphosis of teacher development.

Reflection and Sharing

Much has been presented with regards to new adventures in technology while collaborating. Information technology is strongly based on accessing the Internet to develop intellectual learning. Learning the skills involved in being tech savvy through research techniques and cognitive processing offers life-long skills. The evolving Web 2.0 tools are motivating for students and time saving for teachers.

The collaborative connection allows for deeper understanding of the subject matter. By using the expertise of both the teacher-librarian and the teacher, student learning is enhanced. The steps involved in collaboration: meeting, planning and assessing are straightforward which results in ownership of learning. Applying technology into collaborative situations is empowering. The practical application is rewarding for both the teacher and students and builds technological confidence. The more one practices the skills, the better one becomes at using them.

These new skills are realized when put into context of existing knowledge. The interactive component allows for connections to deepen understanding. Web 2.0 is a new concept to share with colleagues, remembering to keep the approach simple. Success depends on adding one new idea to existing teaching practicing. Through the support, encouragement and flexible schedule that I have, success can be prevalent.

Reflection

Incorporating information technology into teaching has been proven to be valuable by engaging students meaningfully in their learning. With the collaboration between teachers and the teacher-librarian, I can introduce many ways to incorporate technology into the curriculum. The results can be interesting, intriguing, and enjoyable for all. With the use of Web 2.0 tools (such as blogs, wikis, podcasts and VoiceThread) and offering support, I will assist in developing the skills necessary for engaging learning.

What I would like to accomplish as a result of this work is to offer collaboration with my students, colleagues, district staff members, and the community through the use ongoing information technology in classrooms. As well as direct classroom interactions, I

would propose to conduct professional development for staff to develop a more comfortable inclusion of technology into their daily life.

To share in the possibilities that Web 2.0 has to offer and provide this interactivity on the Internet, there are a variety of possibilities. To show how far reaching this interaction can go, I relate an example of how a novel was written with online feedback from students. In a podcast by Enright (2010) on Canadian Broadcast Corporation radio, an interview was conducted with Eric Walters. Walters wrote his latest book *Branded* with assistance from students. The project took place through 53 schools in the Toronto District School Board over a twelve-week period. Walters presented two chapters at a time online. Every Friday he received feedback from the students via emails. He then edited and changed his novel from their suggestions. Waters feels that there are significant changes to the way books are being written, as people want to be part of the process. The interest this book will generate as a result of the connection to those students cannot be measured; it is something they will remember for the rest of their lives. This exemplifies an authentic learning experience.

My experiences have encouraged me to apply my learning from the Teacher-Librarian Distance Learning program. The awakening of the technological aspect to my teacher-librarian position has been phenomenal, uplifting, empowering, enlightening and made me realize there is so much to do. I am so excited to work with others to guide them in new and engaging ways to apply information technology into the curriculum, and to share the rewards with the community. The information technology skills that can be applied on a daily basis can have a life-long learning direction. To be able to share the non-linear, digital thinking that is available on the Internet allows for deeper

understanding to be acquired. This sharing, through collaboration is so valuable for teachers and students because of the long lasting educational effects it has on everyone. I now realize how important the collaborative approach and the technology component are to education; I can hardly wait to get started.

Sharing

Technology is forever evolving in the online environment we experience daily. It would be wise to keep abreast of some of the changes by being involved in online activities. There are so many benefits to being connected, whether teachers stay in touch with their students' needs by teaching how to be web savvy, to students communicating in online environments with other students from around the world, or professionally interacting with peers about common concerns to resolve. Internet can be used professionally and personally as a valuable mechanism to incorporate into everyone's life. By utilizing the impact from access to information, I can see it expanding teaching possibilities immensely. This powerful educational tool has enormous applications.

Collaborative Sharing

I plan to promote information technology into my teaching environment through collaboration. The objective will be to work with people in an inspiring, collegial, supportive manner that includes experiencing interactive opportunities online. By taking a steady, engaging and interactive approach, I hope to foster this collaborative opportunity. It is through this learning environment that I anticipate building teachers' confidence in adapting technological changes in their teaching. It is important to remember to take the time to plan out the collaboration by making connections, creating authentic situations and tying it to the curriculum.

Library Collaboration with Technology

The library is the central focus within a school to provide an all-encompassing approach to learning. As the teacher-librarian, I can provide the connection to bring the inclusion of technology into use. With respect to teachers, the teacher-librarian can guide teachers to engage them in life-long learning. The sharing, showing and hands-on approach of what is available and how it can be implemented can be provided by practical example; I am committed to leading in this sharing capacity.

In the library there are some changes I'd like to incorporate involving the use of technology and collaboration. First, I'd like to conduct a survey with staff and students in my school to ask them for their input on building a library website including what tools, references, and services they'd like incorporated. There also needs to be an interactive component to the library website.

There are always readers in a school library that enjoy fiction. Why not give them the opportunity to share their great reads with others? By offering a blog, book descriptions can be posted for a larger audience to learn about interesting titles. With this format, I'll set up the collection into different genres, allowing for quick and easy navigation. This is not to be limited to students as other staff can also participate with their favourite reads.

Another avenue to research will be the notion of e-books. As students are tied into their hand-held devices, and teachers also have access, what would it look like if books were made available electronically? I'd like to look into this future possibility.

Classroom-based Collaboration

With limited teacher collaboration having been conducted at my school, I will have to start with a few willing participants. In my research, a number of opportunities lie in the field of humanities so that is where I'll start. I am particularly interested in approaching my staff to incorporate information technology into the curriculum by creating wikis and blogs collaboratively. With such references as Kadjer (2003) and Richardson (2009), I feel their practical examples will have affirmative results.

By working hands-on with interested individuals, we will develop blogs in English classes, create videos to be shared online, and incorporate technology into classes by utilizing the Internet for teaching. For the reluctant teacher, I will share these successes and adapt the scenarios to their situation. I can offer time for in servicing, as my flexible schedule allows for collaboration within the day.

Giving specific examples allows for teachers to see how Web 2.0 can be incorporated into their teaching. When students are doing independent novel studies in their classes, we can create a blog or wiki to share their reviews online and ask for peer feedback. During a poetry unit, we can create a VoiceThread where the students share their favourite poems, then ask students to comment online. These examples also allow parents to be involved in their child's learning.

Professional Collaboration

Professional development is ongoing and can be quite worthwhile when you practice new tools and skills; teachers can apply Web 2.0 in their professional development as well. I am willing to offer after school training sessions or provide professional development through conferences. I have prepared a wiki about different

Web 2.0 tools and have shared it with staff and district curricular advisors. It is through such inspiration that accessing new ideas and sharing them is so rewarding.

Teachers can create self-directed web searches for their students. Internet sites such as WebQuest.org or trailfire.org are focused on giving a specific direction for following websites with a sequential purpose. 'Common Craft' also offers videos on understanding Internet terminology for background and familiarity.

Teachers can create connections to further professional development through online associations. Connect with like-minded professionals, by joining a "listserve" or "Ning" in a specialty area. Interests can be professional or personal but the idea is to use this online environment to develop a greater understanding of interacting online.

Personal Adaptations with Technology Implications

Personally, my life will never be the same since I have had my eyes opened to the possibilities of what can be created with numerous Web 2.0 tools. I have two favourites: the interactive VoiceThread, and Real Simple Syndication or RSS. With VoiceThread, there are multimodal components to play with ranging from video, phone and text. My enthusiasm and commitment continues in using RSS where you set up an account and subscribe to information/articles/blogs, etc to follow, and the information is delivered electronically. There is no junk mail and it is a valuable time saver!

Tapping into the information that is available at any moment is truly empowering. There are many tools available and they are rapidly changing, but accessing the possibilities enhances life-long learning. I am in awe of what we can accomplish and what we can share with our students, colleagues and friends.

Conclusion

The list of possibilities is endless, as the opportunity to involve information technology into education has flourished. There is so much to learn and with some collaboration, desire, and commitment, the educational environment can be well prepared, interactive and engaging for all parties concerned. Through a constructivist approach, the deep learning that occurs is encouraging to contemplate. I look forward to this exciting trek with the staff, students and the community.

My hope is to provide an informative, fulfilling, and practical transition towards using information technology within the field of education. Incorporating technology into teaching demonstrates that everyone wins - staff, students, and parents. The increased value of tying into the technology enriches all our lives.

If I could ask one thing of my colleagues, it would be to take one new piece of technology, try it, get to know it, work with it, understand it, and apply it in their teaching, then my aspiration will be realized. This is a realistic attempt to apply the possibilities of technology in the society we live in. I also realize that everyone will grow and develop technologically by trying new technologies, having success, and incorporating these new technology skills in their daily activities. I believe it is through these new experiences that developing of a technological environment results in everyone's lives being richer.

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