Information Literacy, Education for the 21st Century

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ABSTRACT

The 21st century is an era characterized by rapid change. Technological advances, along with other factors, have contributed to the globalization of our society and our economy on an unprecedented scale. However, while our society is visibly changing, our classrooms, in many cases, do not appear to reflect these changes. This paper examines the increased need within our society for higher level thinking skills. The research reveals that a focus on information literacy could provide these foundational skills that are greatly needed to thrive in a constantly changing environment. This paper further examines the meaning of information literacy, its role in education and the terms associated with it, including information technology. Information literacy has evolved in order to meet the demands of an information abundant society and is being recognized as an education for the 21st century.
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SECTION 1: INTRODUCTION

As an educator of children it is important to me that I provide my students with the best education possible, one that will adequately prepare them for a successful future. For the past 10 years of my teaching career I have committed myself to such a task. I have continually searched for ways in which to create learning experiences for my students that I hoped would, not only inspire and engage them in learning, but also give them the necessary skills in which to allow them to continue learning for the expanse of their lives.

However, while working as a teacher librarian in the first five years of my career, I often felt that I wasn’t meeting my own teaching goals. The students certainly enjoyed coming to the library. It was a warm and inviting place, filled with books that they loved, but the research activities and units that I planned, both on my own and in collaboration with other teachers, did not seem to engage or appear to have the lasting impact upon the students that I had hoped.

Of course, as a reflective practitioner, I gave a great deal of thought to what and how I’ve taught my students and always looked for ways to improve my practice. I asked my colleagues for further suggestions and examples of activities that would, not only hook the students into a topic of study, but also motivate them, tap into their creativity and take them to higher levels of thinking than the activities that I had been previously providing for them. I looked to other teacher librarians for materials and ways in which to capture the imaginations of students and immerse them in their learning, so perhaps all wouldn’t be forgotten in a weeks’ time and projects wouldn’t be found in the garbage when the unit was over.

Unfortunately, a passing glance into many classrooms and elementary school libraries will often reveal the same kinds of research projects that have been taking place for the past 20
years: teacher-generated research topics, note taking on predetermined subtopics, followed by
the creation of sentences, paragraphs and a final presentation of the topic on a poster board or in
an essay form. The things that were recommended to me, from various sources, were similar in
nature, encouraging me to continue to teach the same skills in the same way that other teacher
librarians had done for years before me. I too perpetuated these types of research activities. I
was teaching in the way that I was previously taught and in the way that was often expected by
others. It’s not that I felt that my current practice was the best way to teach, but I was certainly
using the current methods accepted by other teacher librarians. No one on my staff ever
expressed any negative feelings about the way in which I taught. In fact, it was quite the
contrary. They sent nothing but praise my way, with regard to my teaching and the activities that
their students were engaged in. However, I always felt as though there had to be another way to
guide student learning. How, I wondered, will the regurgitation of facts prepare students for a
fast-paced 21st century environment? I felt a disconnection between the ways in which I was
teaching and the world outside our schools: a world our students would inevitably have to
function in.

In addition to my continued search to rethink the standard way in which I had been
previously teaching research skills, I had another issue on my mind.... computers! Five of them,
in fact, had been dropped into my newly automated library and I hadn’t a clue what I was
supposed to do with them. You see, I’m what one could to refer to as TSL (technology as a
second language). Technology was my second language and sadly I wasn’t learning to use it
very quickly. Actually, to be more precise, technology was a completely foreign language to me
and I avoided using it whenever possible. I was pleased to see the new computers. They looked
shiny and high tech. However, due to my own limited experience with computers, I wasn’t sure
how to incorporate them into my existing lessons. Fear and guilt were the common emotions
that surfaced when I considered how to best use new technology: fear that I would come off as incompetent in the attempt to teach with the use of computers and guilt that I didn’t expose my students to this new technology.

The children were excited to see the new computers and were certainly ready to get their hands on them, although, I didn’t get the impression that they really knew how to do much with them beyond getting lost on the internet. My school was an annex with grades from kindergarten to grade 4. There was one computer lab in the school taken care of by the computer teacher, the only person who seemed to use computers for anything more than for typing up report cards. Students would visit the computer lab once a week. To my knowledge, when the children went to the computer lab, they were either learning to play *KidsPix*, using the typing program, *All the Write Type*, or using the computer for word processing activities. To my eyes, this didn’t seem ‘ground breaking’.

I ended up using the new computers with grades 3 and 4, but only in a very limited way. During cooperative teaching times with another teacher, I would locate myself near the computers so that I could guide students through the process of searching for books within our own library and to assist them in researching their topics of study. I focused on teaching my students about key word searches for locating information on the Internet. With only five computers, located in the corner of the library (near the electrical outlets), it seemed illogical at that time to do any large group lessons focusing on computer and research skills using the computers. The mere presence of new technology within the library did not do much to alter or change the ways in which I was teaching my students.

My lack of the experience with technology use caused me great anxiety and when something on the computer went wrong and I didn’t know how to fix it, I was frustrated. This perpetuated a cycle of technology avoidance and further frustrations. It was more of a mental
block than anything else. At that time in my life, all my prior research experience was done with books and I did not yet see the purpose of e-mail. "What's wrong with picking up the telephone?" I asked more than once. "I don't have the time to use the computer," was another common quote that came out of my mouth. As I look back, there were two roadblocks: I didn't see the purpose of incorporating the technology into my practice, beyond its use as an additional source of information, and, because of a lack of exposure, I was afraid of using the new technology.

It's been five years since I've worked as a teacher librarian. I'm currently working as a kindergarten teacher gaining valuable teaching experience within the classroom. However, I always assumed that, at some point, I would eventually go back into the library. Therefore, when I decided to go back to university to get my masters degree, I chose to apply to the Teacher Librarianship Program (in the Language and Literacy Department), so that I could continue my search for ways to improve my practice. I felt that to be the kind of teacher librarian that I wanted to be, I needed a combination of library experience, classroom experience as well as further academic qualifications.

When I began the teacher librarian program, I assumed that I would improve my method of teaching research skills to elementary school students and, at the same time, learn how to put those shiny new computers to use. However, my journey has been much more transformative. I've gone beyond my limited search for motivational activities and improved teaching methods. I've taken a broader look at the world, its history and the global changes that are taking place. I've had to deconstruct my own beliefs about teaching and how children learn. I've had to rethink my teaching goals and reflect upon the purpose of education. I've expanded my view of education from my classroom to the world beyond those walls, locating myself within this process. In reflecting upon my beliefs and assumptions about children, teaching and learning,
it's my belief that I will be able to make better choices in my teaching practice, be a better a
guide for my students and become a leader for others in my profession.

I have discovered that my focus on research skills was too narrow, based on an outdated
definition of literacy. Within a world where technology is drastically transforming our society
and challenging traditional notions of literacy, information is being created and obtained from a
much wider array of sources and in a variety of forms and modalities. Therefore, I refocused my
attention from research skills to information literacy, in order to adapt to these changes. In 1989,
the American Library Association recognized this need for a learning process that works with
this growth of information and supports the promotion of lifelong learning. The ALA responded
in the Presidential Commission report in 1989 with the following statement:

What is called for is not a new information studies curriculum but, rather, a restructuring
of the learning process...based on information resources available for learning and
problem solving throughout peoples lifetimes...[which] would not only enhance the
critical thinking skills of students, but will also empower them for lifelong learning and
the effective performance of professional and civic responsibilities. (Bawden, 2001, p. 12)

More recently (2006), the term "information literacy" is more concisely defined by the American
Library Association (ALA) as a set of abilities requiring individuals to "recognize when
information is needed and have the ability to locate, evaluate, and use effectively the needed
information" (American Library Association, 2006).

This research paper will explore the following questions in terms of elementary
education:

- What are the skills necessary to help students succeed in the 21st century?
• How can educators improve their practice and promote skills necessary in the 21st century?
SECTION 2: LITERATURE REVIEW

The intent of this review is to acquaint the reader with the major studies and theoretical works relevant to the area. To that end, the present section discusses issues related to the impact of technology and globalization on society and the resulting need for educational change; information literacy what it means and its role in propelling “the information society of today into the learning society of tomorrow” (Bruce, 2002, p.1); terms associated with information literacy and, finally, informational technology.

Skills for the 21st century

Current researchers have produced literature addressing the impact of technology and globalization upon society, demonstrating a need for changes to educational pedagogy in the 21st century. They also look at the new literacies that students are going to be faced with, as they embrace their futures outside of our institutions. As we become immersed within this age of information, the need for higher-level cognitive skills is becoming increasingly apparent, as is our need for a change in educational practice.

The 21st century is an era characterized by rapid change. Technological advances, along with other factors, have contributed to the globalization of our society and our economy on an unprecedented scale. We are moving away from the old model of capitalism to a new capitalism, characterized by global markets, global networks, and information rich environments. As the upcoming generations embrace their futures outside of our institutions, it is imperative that we facilitate the type of learning that will lay the groundwork for a successful future in this global society. The basics of yesterday will no longer be sufficient for the future of tomorrow.

The old model of capitalism was a time marked by highly hierarchical workplace relationships and mass production. This was a time that was, “epitomised in Henry Ford’s development of mass production techniques and represented in caricature by Charlie Chaplin in
the film Modern Times- an image of mindless, repetitive unskilled work on the industrial production line" (Cope and Kalantzis, p. 11). The structure of today's work places and the nature of work certainly differ from this historical picture.

Today, we are in transition from this industrial capitalism to a technological era of global capitalism, sometimes referred to as new capitalism or post-Fordism. Technology has changed the way that our economy is organized and businesses have to be flexible enough to respond and adapt to this constantly changing technology. In this era, information is the key and within this type of work place, the organization needs to be such that, it is able to maximize the knowledge and skills of a team of workers.

New capitalism requires people who will be able to work together and collaborate as team players because, as James Paul Gee (2002) puts it, “a team can behave smarter than any individual in it by pooling and distributing knowledge” (p.65). Individuals who are adept at networking and recreating themselves according to the demands of the market are going to do well in a work environment where technology is contributing to fast changing global markets. The speed at which businesses are able to access information, are going to affect the level of success they are able to achieve. In addition, young people are going to have to be able to be creative problem solvers and successful communicators. The need for these higher level-thinking skills has important implications for education itself. In order to obtain these higher order-thinking skills, educators are going to have to adapt the curriculum to include activities that promote, critical thinking, problem solving, collaboration and creativity.

In addition to higher level thinking skills, the technological advances that have accompanied this new capitalism, have also brought with it a need for people who are fluent with the new literacies that have emerged. In the past, educators defined “literacy in terms of alphabetic practices only” (Selfe and Hawisher, 2004, p.233). However, in the 21st century,
literacy includes new media texts. Learning these new literacies have become additional requirements for people who want to compete in a rapidly changing global market. This has an important impact upon educational pedagogy and how we teach literacy in the future.

Changes in literacy, which are brought on by advances in technology are, of course, not a new phenomenon. “Throughout history,” says Donald Leu (2004), “literacy and literacy instruction have changed regularly as a result of changing social contexts and the technologies they often prompt” (p. 4). For example, the earliest evidence of written language, in the fourth century B. C., came about with the improvement of agricultural technologies. These early people in the Sumerian society developed new technologies for the purpose of recording business type transactions (p. 3). The changing role of the church in the 15th century, in a society that was becoming more secular, created an increased demand for books. The invention of the printing press in about 1450, allowed individuals more access to these written literacies, thereby contributing to the spread of conventional literacies, as we know them.

Today, with the invention of digital technologies and the Internet, the definition of literacy is again changing, which has important implications for education itself.

Teachers must be ready to meet the needs of students who compose meaning not only with words, but also with digitized bits of video, sound, photographs, still images, words, and animations and to support communications across conventional linguistic, cultural, and geopolitical borders. (DeVoss, 2004, p.183)

Thus, literacy is moving away from printed text as the “primary source of meaning making” (Kapitzke, 2003, p.53).

**Back to Basics**

With this in mind, it becomes disturbing to hear present day politicians calling for schools to get ‘back to basics’. ‘Back to basics’ is a term that in fact refers to literacies based in
print. If public education were to move in this direction, then it would in fact be a move backwards. It would mean that some children would receive a minimal level of skill and those that can afford it, would receive the skills necessary to maintain their place at the top of societies’ hierarchy. The basics of yesterday are no longer the basics of today. New capitalism values skills that are above and beyond the basics highlighted in the era of old capitalism.

Gee (2004) mentions two choices. We can give up on public schools and offer only the basics, marginalizing disadvantaged children who will have to struggle to obtain “portfolio-forming” activities outside of school.

The other is to fight the neoliberal agenda and make schools sites for creativity, deep thinking, and information of whole people; sites in which all children can gain portfolios suitable for success, but success defined in multiple ways, and gain the ability to critique and transform social formations in the service of creating a better world for all. (p.81)

It is essential, therefore to not only integrate these new literacies into the classroom, but to also teach a pedagogy that includes the higher level thinking skills that allow students fluency when working with such literacies. Our society is changing. It is the job of educators to prepare students for involvement in such a society.

However, while our society is visibly changing, our classrooms, in many cases, do not appear to reflect these changes. In a study by Bowler, Large and Rejskind (2001) on how students accessed, interpreted and used information from the web, they commented “it seemed ironic that with all the multi-sensory information available on the Web, the students in this study used information in the most traditional ways” (p. 221). The authors observe, “that simple fact-finding skills will not suffice in the knowledge society” (p.205). To continue to teach things in the same way, in order to maintain our own comfort zone, does a disservice to our students and to ourselves, as educators.
Information Literacy Debate

Information literacy has evolved in order to meet the demands of an information abundant society. The increased need within our society for higher level thinking skills, has led to a proliferation of research on this topic. Rader (2002) noted:

[T]he number of publications related to user instruction and information literacy, like the field itself, show phenomenal growth during the past three decades as demonstrated by the fact that in 1973 twenty-eight publications were viewed, and in 2002 more than 300 publications dealing with the topic of information literacy will be issued. (p.1)

It has been argued that an education, with a focus on information literacy, could provide the foundational skills that are greatly needed to thrive in a constantly changing environment. Christine Bruce (2002), Associate Professor of Queensland University of Technology, writes, “Information literacy is the catalyst required to transform the information society of today into the learning society of tomorrow” (p.1). However, the definition of information literacy and its role within our educational systems continues to be debated.

Bruce (2002) writes that, “Information literacy…has taken shape and strengthened to become recognized as the critical literacy for the twenty-first century.” She describes information literacy as “the foundation for learning in our contemporary environment of continuous technological change” and the “catalyst required to transform the information society of today into the learning society of tomorrow” (p.1). It is this type of learning that could transform an education system that is falling behind the times.

Traditional curriculum...has often been ineffective in preparing students to learn independently...[and] that a much more sophisticated view of information use and users will be essential if higher-order cognitive and problem-solving skills are to be taught more effectively. (Moore, 1995, p. 30)
Penny Moore (2000) concludes with this statement, following a study of 23 grade 6 students, which explores the cognitive and metacognitive demands of the initial stages of gathering information for elementary school research assignments (p.1). Information literacy focuses on more than just a few skills. It also focuses on the ability to process the information. "Its central processes draws on critical thinking, problem solving, and development of extensive understanding of information functions and systems in the context of the curriculum and beyond" (Moore, 2002, p. 2).

**Terms Associated with Information Literacy**

Information Literacy, a term first used in the 1970's, has been evolving for over 30 years, as a means to meet the demands of a changing information environment and is often confused with other terms. David Bawden (2001) writes about the various concepts of literacy that are closely associated with information literacy.

Some of these for example, library, media and computer literacies, are based largely on specific skills, but have some extension beyond them. They lead to general concepts, such as information literacy and digital literacy, which are based on knowledge, perceptions and attitudes, though reliant on simpler skill-based literacies. (p. 1)

Library skills, while describing the ability to locate and evaluate relevant information, was too limited in scope and too centered on the library (p. 5). Similarly, computer and media literacy were also too narrow in scope to apply to encompass the 21st century information needs.

Computer literacy describes the competent use of computers, while media literacy refers to an understanding of things such as T.V., Internet, newspapers and magazines, etc (p. 5-6). While these terms are included and overlap with the term information literacy, they do not go far enough to encapsulate a broader spectrum of skills and deeper levels of thinking required to utilize information for a multitude of purposes.
Information Technology

Information Technology is a term that has also received a great deal of attention in education in the 21st century. Indeed it has been information technology, rather than information literacy, that has become the focus of educators and others, as a means by which to meet the challenges of this generations’ information rich environment. However, simply applying new technology in old ways does not help students cope with the vast amounts of information that they are faced with. In essence, without proper instruction, more technology without information skills is little more than an expensive rug thrown over a deep hole in the floor. You can spend as much money as you want on that rug, but it does not change the fact that there is a problem underneath that needs to be mended. Once the rug is stepped upon, you may still fall into the pit of information overload.

While information technology has much to contribute via digital sources and through an understanding of how the technological world works, it does not go far enough to promote lifelong independent learning. Bruce (2002) writes in her paper Information Literacy as a Catalyst for Educational Change: A background Paper, that “While information technology may be required to deliver the information, information literacy is needed to critically evaluate and make effective use of the information delivered” (p.2). Similarly, Bundy (2004) comments in his article One essential direction: information literacy, information technology fluency, that the “Sheer abundance of information and technology will not in itself create more informed citizens without a complementary understanding and capacity to use information effectively” (p. 14). Immersing students in technology alone will not bring about an understanding about how to utilize information in a purposeful way. Information literacy can be promoted through information technology, but information technology is not sufficient in developing the ability to process information.
Information technology, in many ways, has been more successful in achieving support because it is an extremely visible and arguably easier way to be seen as coping with the 21st century issues. Large amounts of money have been poured into the education budgets to meet the technology demands of educational institutions. However, as we have previously discussed, the presence of technology alone does not necessarily change the way that educators teach and it is a change in educational focus that is needed to keep up with the daily challenges in a 21st century society. New technology is a concrete response to an obvious need. However, this response lacks the full understanding of the issues involved.

In addition, many schools still lack appropriate levels of access to updated technology. Additionally, many teachers who do have access to updated technology are not comfortable, due to lack of experience, in dealing with the new technology. Bruce (2004) points out, “the information literacy agenda may be advanced as a consequence of new information technologies, or in the absence of an appropriate IT infrastructure” (p. 2). It is important, therefore, to demonstrate to teachers that they can begin to contribute to a student’s future success in the 21st century, regardless of the technology situation in their schools.

Technology is changing our society and it is important that our students have experiences with the new literacies that they are going to be faced with both inside and outside educational institutions. However, just as we learn how to work with one program or digital application, there is yet another one in its place. What new technology lies around the next corner is unpredictable. What is predictable, however, is the need for workers and citizens that are able to cope with this rapidly changing society. When one focuses too heavily on the technology side of the equation, they are ignoring this more important issue: we need to prepare students to cope with the vast amounts of information that are produced in this era of technological advances. Technology is a tool to be used by people for a variety of purposes. While experiences with its
usage are certainly valuable and contribute to a 21st century education, they will not provide students with the educational processes that will transfer learning skills to every aspect of their lives. It is therefore, essential to emphasize the importance of information literacy in a 21st century education.

Implementation of information literacy, while gaining interest in some teacher librarian circles, has not yet expanded its domain to encompass as wide an educational scope as one might expect, given the vast amounts of information that characterize the 21st century. Kapitzke (2001) notes “information literacy should not be the domain of the teacher librarian alone and that training in it should be integrated across all subject areas” (p.3). Bundy (2004) supports this notion and states, “Information literacy is not a library issue—it is a whole of education issue. Better partnerships between teachers, librarians, learning developers and instructional designers are therefore needed to embed information literacy in the curriculum, pedagogy and assessment” (p. 19). Bruce (2002) suggests that the way to do this is for teacher librarians to provide the leadership role in promoting the concept of information literacy...a process that can be applied to a broader educational environment (p.14). With a wider collaborative effort between educational staff members, greater changes can be made to make curriculum more current and relevant to today’s student.

If we, as educators, want our students to have an education that will adequately prepare them for a future in the 21st century, then we must adapt educational pedagogy to reflect the new literacies brought about through rapidly changing technology. As Claudia Wallis and Sonja Steptoe (2006) write, teachers need “to bring their methods—along with the curriculum—into line with the way the modern world works” (p. 5). We also need to provide students with the skills that will allow them to thrive in an information rich environment: problem solving, critical thinking, collaboration and creativity are all key skills that will allow students the ability to adapt
in the fast-paced society of tomorrow. Information literacy "provides a powerful framework for integrating learning skills and strategies across the curriculum, as well as enabling educators to harness the potential of ICT" (Moore, 2002, p. 3). Information literacy will bring education into the 21st century.
SECTION 3: CONNECTIONS TO PRACTICE

I have prepared a three part series of workshops, titled “Education in the 21st Century,” to be presented to educators at the elementary school level. The creation of these workshops is a response to societal changes brought about through technological advances and the educational changes that are needed in order to thrive within this 21st century society because, as C. M. Reigeluth (1999) writes, “as we evolve deeper into the information age, learners need more skills for complex cognitive tasks” (p. 21). In order to meet these challenges, I will promote an information literacy framework as a means of adapting our curriculum and pedagogy to incorporate the higher level thinking skills that students will need in order to use new technology effectively and thrive within our information-rich society. Once educators have gained an understanding of these issues within the first two workshops, we will then examine the integration of technology and its role in education. Within the third workshop, participants will have the opportunity to work with web 2.0 tools and explore the possibilities of applying these tools in the promotion of these higher level-thinking skills, within an information literacy framework.

These three workshops are for the many educators that are having concerns that are very similar to the ones that I’ve experienced: they want to provide their students with an education that prepares them for the 21st century; they want to move away from teaching that promotes the ‘regurgitation of facts;’ and while they want to incorporate technology into the learning process, they feel resistant to venturing into unchartered territory, due to their lack of experience. Therefore, I will order the three workshops in such a way, that educators, such as myself, who have had some or all of these concerns, can be guided into the 21st century without those feelings of guilt, fear or discomfort that often accompany societal changes of the scale that educators are now facing.
When we learn something new, we often try to make connections to something we already know about the world ("Oh yah...that's a lot like when..."). Tension can result when we encounter something that is new in our lives and does not connect in a positive way to our existing base of knowledge. For example, people who have not grown up in a technological era, given the label ‘mindset 1’, according to Knoebel and Lankshear (2006), may have difficulty incorporating new technology into their lives. And of course, why wouldn’t they? History is full of examples of people rejecting new thoughts and ideas, sometimes violently, that don’t meet with their existing framework.

Whether or not a change is embraced or rejected often hinges on whether the change makes something in our lives better or worse. The cellular phone, for example, was a hit for me. To be connected to friends and loved ones, no matter where I was...sign me up! I love to talk! The Internet, however, took me longer to accept. While it could use be useful for finding information, it also came to represent other things in a more negative way for me. It would frequently take me a long time to find what I wanted, due to my lack of experience in ‘surfing’ the web. With my busy schedule, I found myself wondering why anyone would want to waste so much time sitting at the computer when they could simply pick up a book or the phone. At that time, I was not yet convinced of the potential of this new technology.

Like many my age (over 35) and older, I fall under the heading of ‘mindset one.’ I do not embrace technology for the sake of technology! However, I do not consider myself to be closed-minded either. I was searching for meaning, with an attitude of “show me how this is going to improve my way of life and the lives of my students”, “where is our future going” and “how can we make it better?” As I’ve discovered many of the possibilities of using technology in the promotion of lifelong independent learning, I’ve transformed from the person who avoids
technology, to the person who seeks out the kind of technology that will support educational practices that will prepare students for the emerging new global environment.

Resistance will often occur when changes are pushed on people who have not had a chance to see the whole picture that surrounds an issue. It is my intention to ease educators into the 21st century, within the non-threatening learning environment of my workshops, in such a way that lowers the resistance to change that can occur when people are not adequately prepared for these changes. I will prepare educators for the educational changes that are necessary in this current environment by providing them the ‘big picture’ first, followed by a plan to work towards these necessary changes. I want educators to leave my workshops with a vision of education that sees information literacy as a means to meet the challenges of the 21st century and sees technology as a means to supporting this vision.

The first part of my workshop series will focus on the historical, economic and political forces that shape education. With a greater understanding of these forces, educators will become aware of the need for educational change that has become necessary, as we’ve entered into this age of information, where technology has changed many aspects of our society, creating a need for people with the ability to meet these new demands. I intend to focus upon the cognitive aspect of technology, rather than the technology itself, because while technology continues to change at an unprecedented rapid rate, the skills in which we will need to use these technologies are constant. I am going to provide my audience with ways in which they can combine traditional literacies with the kinds of skills that will help them gain the new literacies. This first workshop will essentially be a rationale for educational change.

The second part of my workshop series will build upon the information provided in the previous workshop, discussing societal changes and education in the 21st century and will proceed further to focus upon the evolution of information literacy and ways in which
information literacy can provide the instruction needed to address the current environment. It will give educators the opportunity to examine ways in which they can change or adapt their teaching in order to promote a higher level of cognitive reasoning, rather than simply accommodating the traditional passive intake of information. Participants will take traditional research projects/activities and explore alternative ways to create learning opportunities for students within an information literacy framework that would better suite students entering into this 21st century environment. This second workshop will give educators further direction towards an educational vision that will work towards meeting the demands of the 21st century.

The third part of my workshop series will focus on the integration of technology into education. I will begin by reviewing the path of past attempts for technology integration within our educational institutions and will spend some time considering the impeding obstacles that have thus far prevented technology from becoming fully integrated into our educational institutions. While technology is a tool that has the potential to support a more child-centered approach to learning and teaching, it is currently not being used to achieve this goal. We will take a closer look at the obstructions to technology integration, such as the existing structures, which lack the flexibility that this approach needs to become successful. It will be made evident, that in order to provide students with the education that they need in order to develop to their full potential within a 21st century environment, it is worthwhile and important to continue to invest in computers for schools. However, we also need to be aware that each part of our educational system, including the integral structure of the school, the curriculum, pedagogy and assessment, is connected. Therefore, all areas within education will have to be brought into line with our central learning objectives, as opposed to focusing on a single tool, such as the computer.
The second section of my third workshop on technology will introduce web 2.0 applications and demonstrate how they can be used to support teaching that promotes higher level thinking skills. I have left this workshop, which gives people hands-on experience with new technology, until the end. The reason that I did not want to begin with a focus on technology is twofold. Firstly, in the past, while goals concerning technology focused mainly on the medium itself, today’s goals must begin to focus upon the educational objectives and the changes that are needed in order to achieve these objectives. As technology continues to become woven into the fabric of our society, it is becoming increasingly important for today’s student to become fluent in its usage. As Chris Dede (2000) puts it, “participants in knowledge-based economies increasingly must grapple with important political, environmental, and social issues that can only be understood through the integration of and visualisation of multidimensional data” (p. 7). However, if technology is incorporated into the curriculum as a tool for the participation in research-based, problem solving activities that encourage collaboration and promote higher level thinking skills, then there is far greater potential for our efforts to result in improved teaching and learning within our educational institutions. I want the workshop participants to adopt a view that technology can be used to support a 21st century education, but technology alone is not the answer to the information overload that our society is now faced with. This message may be lost if the technology portion of the workshop is presented first in the series.

Secondly, many people are uncomfortable using technology and therefore, those who need the most direction with new technology will often avoid technology workshops in the first place. I want educators to be ready to embrace the technology with an open mind, without the fear and apprehension that exists within many of them. Many people who are not comfortable with new technology often avoid it, all together, if they can help it. I believe it would be more
beneficial to first educate people as to the rationale behind integrating the use of technology into schools and second, provide them with ways in which they can move more easily in this direction. If I can affect their mindset to technology first, then they will be more responsive to future technology presentations.

By the end of the third workshop, I want educators to see how all the pieces of the puzzle fit together to form the whole picture, as opposed to getting a piece-meal view of the 21st century, where technology is the primary focus without a vision or framework for which to guide educationally sound decisions for teaching and learning. I want them to be able to make new connections between the past and present education system, the demand for future educational changes, the framework and vision for meeting these new demands and the technology that can contribute to meeting these new demands. The workshops will build upon each other and be offered as follows:

**Workshop 1: Education in the 21st Century** (see Appendix A):

Objectives for this workshop are:

- To reflect upon the purpose of education
- To gain a historical perspective of work and reflect upon “old capitalism”
- To gain a current understanding of the new work place demands, referred to as “new capitalism”
- To gain an understanding of the higher level thinking skills that are needed within 21st century society
- To reflect upon the changes in literacy
- To gain an understanding of the changes to education that are required to meet the needs of the 21st century
• To gain an understanding of the term “back to basics” and how this term has been used to the disadvantage of some students

• To gain an understanding about the definition of technology and the ways in which technology can be included in the classroom

Materials/Technology needed:

• Laptop computer

• Projector

• Screen

• Chart paper

• Felt

• Book: Jump, Frog, Jump by Robert Kalan

• Handouts for participants

• Bags of building materials (construction paper, glue, ruler, popsicle sticks, straws, pencil)

Shape of the day:

• Introduction/workshop overview

• Agenda, objectives

• Brainstorm their perceived understanding of the purpose of education

• Power point presentation on education in the 21st century

• Hands on, collaborative activity, promoting 21st century skills

• Discussion/reflections

• Summary, wrap-up and evaluation

Activities will include:
• Participants will brainstorm and web their ideas, within table groupings, on their perceived understanding of the purpose of education (the chart paper with each brainstorming web will be placed at the front of the room)

• Power point presentation on education in the 21st century (see Appendix A)

• Working collaboratively in table groups, participants will collaboratively design and build a frog that jumps and a scene from *Jump, frog, jump*, by Robert Kalan, using only the materials provided. In order to solve this problem, they will discuss the problem, brainstorm and gather information, choose a best solution, implement a plan and reflect on the process and product (Dawn Theelke, 2000, p. 7).

• Participants will share the process in which they were able to create their frogs (referring to the development of their focus, the development of their framework, their choice of the best solution and the implementation of their plan).

• Participants will reflect, once again upon the purpose of education, referring to their earlier brainstorming and make connections with the changes in the 21st century and the educational process in which will support this environment

**Workshop 2: Information literacy and education in the 21st Century** (see Appendix B):

Objectives for this workshop are:

• To gain an understanding about the ‘information explosion’ in 21st century society

• To gain an understanding about the skills that are necessary for people to cope in such an information-rich society

• To gain an understanding about how information can assist students meet the challenges of the 21st century
• To reflect on terms often confused with or terms which overlap with information literacy
• To explore the various definitions offered to explain information literacy
• To differentiate information literacy from the term information technology
• To reflect on the inability of traditional literacy to prepare students to learn independently and use information critically
• To discuss the implementation of information literacy across the curriculum

Materials/Technology needed:

• Laptop computer (internet access needed)
• Projector
• Screen
• Sample lesson plans (traditional research activities)
• Pens
• Paper
• Handouts for participants

Shape of the day:

• Introduction/workshop overview
• Agenda, objectives
• Brainstorm traditional research activities and the usual components
• Video presentation
• Power point presentation information literacy
• Information literacy activity
• Discussion/reflections
Summary, wrap-up and evaluation

Activities will include:

- Brainstorming traditional research activities at table groups
- Video presentation, *Information R/evolution* by Michael Wesch
- Power point presentation on information literacy (see appendix 2), which includes a video presentation, *21st Century Pedagogy* by Greg Whitby
- Working collaboratively in table groups to transform traditional research activities into information problem-solving activities
- Participants will share how their activities fit into the information literacy framework
- Participants will reflect on the process of incorporating higher level cognitive skills into their activities

**Workshop 3(a) Education and the Integration of technology** (see Appendix):

Objectives for this workshop are:

- To reflect upon past investments and attempts, within education, to integrate technology
- To discuss the differences in environment within and outside of schools
- To discuss the achievements or lack of achievements made through information technology
- To compare the integration of technology between schools with other kinds of organizations
- To reflect upon the obstacles of technology integration
- To discuss the structure of our educational institutions
• To discuss pedagogically sound technology integration: "a clear vision of our goals and well-developed plan for achieving them" (Kleiman, 2000, p. 1)

• To discuss new instructional approaches and new organizational structures

Materials/Technology needed

• Laptop computer
• Projector
• Screen
• Smart board
• Chart paper
• Felts
• Handouts for participants

Shape of the day:

• Introduction/workshop overview
• Agenda, objectives
• Video presentation
• Power point presentation on education and the integration of technology
• Brainstorm the use of technology within their own schools
• Discussion/reflections
• Summary, wrap-up and evaluation

Activities will include:

• Viewing the video, *A Vision of Students Today* by Michael Wesch
• A power point presentation on the integration of technology (see appendix 3)
- Listing all the ways in which technology is presently being used within the participants' schools

- Discuss the integration of technology, past, present, and future

- Reviewing the participants' lists of technology usage within their own schools and identifying the learning objectives achieved within the present usage within participants' schools

- Reflecting on the changes necessary in order to transform and harness the full potential of technology

**Workshop 3(b) Education and Web 2.0 (see Appendix D):**

Objectives for this workshop are:

Materials/Technology needed

- Computer lab

- Smart board

- Microphone

- Paper

- Pens

- Handouts for participants

Shape of the day:

- Introduction/workshop overview

- Agenda, objectives

- Video presentation

- Present website, Education and Web 2.0
• Web 2.0 activities: Wikis, Blogs and Podcasts (including videos to introduce each activity)
• Discussion/reflections
• Summary, wrap-up and evaluation

Activities will include:

• Video presentation: *Did You Know 2.0*, by Karl Fisch and Scott McLeod
• Discussion of video question: How are we helping our children to become literate in the 21st century?
• Website presentation introducing education and Web 2.0 (see appendix 4)
• Video presentation, *Wikis in Plain English* by Lee LeFever, 2007
• Wiki activity: Participants will discuss the video in small groups (2-3 people) and brainstorm ways in which wikis could be useful in the classroom. Participants will add their ideas to a wiki site (Participants will also have future access to this wiki, for viewing and further contributions, after the workshop is over, from within the workshop blog site).
• Discussion/reflection on wiki activity including further examples of wikis used with elementary students
• Video presentation, KPN: *Collaborative Online Learning With Podcasting*
• Participants will hear the story, *The Lorax* by Dr. Seuss
• Podcasting activity: Participants (in small groups) will choose an environmental issue evolving from the story. Participants will write a script arguing two possible opposing views to this environmental issue. Participants will record their podcasts (Later, these podcasts will be uploaded to the workshops blog).
• Video presentation, *Students and Blog* by Rachel Boyd

• Blog activity: Participants will have the opportunity to begin blogging their reflection about what they’ve learned in this workshop, Education and Web 2.0 (participants will have the opportunity to continue blogging at home)

Within this series of workshops, *Education in the 21st Century*, educators will gain a greater understanding of pertinent educational issues of the 21st century. Participants will have the opportunity to connect the societal changes outside of their schools to the needs for change within their schools. In addition to this rationale for change, we will explore the higher-level cognitive skills that are necessary to meet the challenges of this 21st century environment. Information literacy will then be presented as a means in which to achieve these central learning objectives. In addition, participants will be able to build their confidence with technology, as they work towards the development of an information literacy framework. It will be made clear that information technology should be used in a supportive role to the development of information literacy, but that it does not develop the processing information ability and therefore is not sufficient on its own. It is my objective that the audience will walk away with ideas that they can (and will not be afraid to) incorporate into their teaching immediately, not when they get better access to computers and the internet, etc. The ideas within this series of workshops will be presented to educators through a gradual process, beginning with ‘big picture’ and moving to the practical application within the classroom.
SECTION 4: CONCLUSIONS

Advances in technology and the resulting effects of such developments have permeated our society, creating a need for change within our educational institutions. To prepare students for the 21st century, a time characterized by rapid change and an abundance of information, educators need to focus their attention on the skills that are necessary in order to meet the challenges of this new type of environment. To continue to teach things in the same way as we have done in the past, as many educators continue to do today, is essentially like preparing students to live in the previous century and is a step backwards. It is essential that we now look towards the future by promoting 21st century skills, ones, which can assist students to thrive within today's environment and can prepare them to meet the challenges of tomorrow.

To succeed in this new era of increasing technological development, information and globalization, students need to be creative problem solvers, critical thinkers and have fluency in the new literacies, in addition to the traditional literacies. Information knowledge is the key to success in the 21st century and people need to be able to work together, maximizing their assets. Therefore, it is also important that students be able to work collaboratively with others to construct knowledge and solve problems. Learning that promotes higher level thinking skills will transform our education system into one that is more relevant for our time.

The purpose of this capstone paper, and the resulting series of workshops, is to encourage educators to change their educational pedagogy, in order to address the educational needs of the 21st century. We are living in a society where information is being created at an unprecedented rate. It therefore makes it all the more important that we teach students to use information in a more sophisticated fashion. The location of information and regurgitation of facts will not sufficiently prepare students for today's world. After reviewing the literature, I found that educators can promote the skills necessary in the 21st century through problem-based
assignments using an information literacy framework. The implications for learning through this process are that students will become more likely to flourish within the fast pace of a global and highly technical society and they will gain the ability to cope within a knowledge-based economy. In essence, through information literacy, the world inside of our educational institutions will become more reflective of and more compatible with the world outside of our institutions.
REFERENCES


*Time*, Retrieved Dec 10, 2006, from


http://www.youtube.com/watch?v=dGCJ46vyR9o


http://www.youtube.com/watch?v=-4CV05HyAbM


http://www.youtube.com/watch?v=l72UFXqa8ZU
Appendix A
What is the purpose of Education?
Old Capitalism

- Mass production
- Unskilled workers
- Vertical hierarchy
New Capitalism

- Hyper-competition for consumers and markets across the globe (Gee, 64)
- Multi-skilled, well-rounded workers (Cope, n)
- Horizontal Hierarchy (teamwork)
Higher Level Thinking Skills

- Problem solving
- Critical thinking
- Collaboration
- Creativity
Changes in Literacy

• Invention of the alphabet, 4th century BC
• Printing press, 15th century
• The computer and the internet, 21st century
“Teachers must be ready to meet the needs of students who compose meaning not only with words, but also with digitized bits of video, sound, photographs, still images, words, and animations and to support communications across conventional linguistic, cultural, and geopolitical borders.” (DeVoss, 183)
Back to Basics?
Technology: the practical use of ideas, materials and energy in order to create products, knowledge, processes, and systems to improve society.

(from Ontario, Ministry of Education documents, 1994, p. 3)
Some ways in which technology can be included in the classroom:

- Hands-on exploration of materials
- Study of structures
- Design (build and test) simple machines
- Learn about power and energy
- Study of ergonomics (how to make products more comfortable and user-friendly for people)
- Explore aesthetics through different art mediums
Five major stages to technology integration in the classroom:

- Develop a Focus
- Develop a Framework
- Choose a Best Solution
- Implement a Plan
- Reflect on the Process and Product

If we, as educators, want our students to have an education that will adequately prepare them for a future in the 21st century, then we need to bring our methods and curriculum in line with the way the modern world works (Wallis and Steptoe 5).
Further readings


Hill, Ann Marie. *Technology in the Elementary School*. MSTEnews, volume 4, number 1

A publication of Mathematics, Science and Education Group, Faculty of Education, Queen’s University, Kingston, Ontario


Wallis, Claudia & Steptoe, Sonja. (2006) *How to Bring Our Schools Out of the 20th Century*
Appendix B
Information Literacy, Education for the 21st Century
Information Explosion
"Sheer abundance of information and technology will not in itself create more informed citizens without a complementary understanding and capacity to use information effectively" (Alan Bundy, 2004, p.14).
“Information literacy is the catalyst required to transform the information society of today into the learning society of tomorrow” (Christine Bruce, 2002, p.1).
“The number of publications related to user instruction and information literacy, like the field itself, show phenomenal growth during the past three decades as demonstrated by the fact that in 1973 twenty-eight publications were viewed, and in 2002 more than 300 publications dealing with the topic of information literacy will be issued” (Hannalore B. Rader, 2002, p.1).
Information and digital literacies; a review of concepts.
David Bawden (2001)

- Information literacy
- Computer literacy (information technology)
- Library literacy (library skills)
- Media literacy
- Network literacy (internet literacy)
- Digital literacy

While these terms are included and overlap with the term ‘information literacy,’ they do not go far enough to encapsulate a broader spectrum of skills and deeper levels of thinking required to utilize information for a multitude of purposes.
"While information technology may be required to deliver the information, information literacy is needed to critically evaluate and make effective use of the information delivered" (Christine Bruce, 2002, p. 2).
Traditional curriculum... has often been ineffective in preparing students to learn independently. [A] much more sophisticated view of information use and users will be essential if higher order cognitive and problem-solving skills are to be taught more effectively" (Penny Moore, 1995, p. 30).
Information literacy

Focuses on:

• Critical thinking
• Problem solving
• The development of extensive understanding of information functions and systems

(Penny Moore, 2002, p. 2)
"Information Literacy...is an intellectual framework for recognizing the need for, understanding, finding, evaluating, and using information-activities which may be supported in part by fluency with information technology, in part by sound investigative methods, but most through importantly, through critical discernment and reasoning" (Alan Bundy, 2002, p. 14-15).
Information literacy ensures that students are competent in six general areas:

- Recognizing a need for information
- Identifying what information would address a particular problem
- Finding the needed information
- Evaluating the information found
- Organizing the information
- Using the information effectively in addressing the specific problem

(American Library Association 1989)
21st Century Pedagogy
by Marco Antonio Torres

http://www.youtube.com/watch?v=l72UFXqa8ZU&feature=channel_page
Information literacy:

- provides a powerful framework for integrating learning skills and strategies across the curriculum, as well as enabling educators to harness the potential of ICT” (Penny Moore, 2002, p. 3).

- Is a process approach in which content is no longer paramount, but rather the ability to learn
- Is not a program, but a way of learning (Christine Bruce, 2004, p. 12)
Information literacy is not a library issue—it is a whole of education issue. Better partnerships between teachers, librarians, learning developers and instructional designers are therefore needed to embed information literacy in the curriculum, pedagogy and assessment” (Alan Bundy, 2005, p. 19).
Information literacy is a prerequisite for:

- Participative citizenship
- Social inclusion
- The creation of new knowledge
- Personal empowerment
- Learning for life
Information literacy education has emerged as a framework for equipping students with the skills necessary to meet the new demands deriving from constant change and the inundation of new information.
Appendix C
Education and the Integration of Technology: Harness the Potential

by Maria Donovan
CUST 562
"Billions of dollars are being spent on computers in Schools. Are such expenditures worth it?" (Michael W. Apple, 2004, p. 513)
“Today’s child is bewildered when he enters the 19th century environment that still characterizes the educational establishment where information is scarce, but ordered and structured by fragmented, classified patterns, subjects, and schedules.”

(Video: A Vision of Students Today)
After almost two decades of intense promotion of information technologies by business leaders, policy makers, and parents, most teachers and students now have far more access to machines and software both in school and at home than ever before. Yet, nationally, most teachers and students are occasional, to rare, users (at least once a month) or they are nonusers of these machines in classrooms for instruction. Furthermore, when teachers do use computers for instruction, another discrepancy arises. When teachers adopt technological innovations, these changes maintain rather than alter existing classroom practices.

(Larry Cuban, 2001, p. 815).
“Most policy makers, corporate executives, practitioners, and parents assume that wiring schools, buying hardware, and distributing the equipment throughout will lead to abundant classroom use by teachers and students and improved teaching and learning” (Larry Cuban, 2001, p. 813).
What happened???
What are the obstacles to technology integration?

- Inadequate resources
- More time needed
- Teachers that have grown up in ICT-poor environments
- Lack of professional development opportunities
- Evaluation tools

(Aviram, 2000, p. 336).
"Over the past two decades all kinds of organizations have undergone radical changes motivated by ICT and have done so quickly, in spite of the fact that a large part of their personnel grew up in ICT-poor environments, regardless of the fact that the technology has been immature, and often with impressive results using standard evaluation methods" (Aviram, 2000, p. 337).
“Aviram (2000) explains, the most rational explanation for “the slow adaptation of education systems to the new ICT culture” is the “serious structural obstacles built into the organization of current forms of schooling prevent real change in learning/teaching methods necessary to take advantage of new ICT” (Aviram, 2000, p. 336).
What is the hidden curriculum within the structure of our educational institutions?

- **Hierarchy**: refers to the principle whereby most of the activities that occur within schools, including their contents, order, structure and methods, are dictated to both the teachers and students by the overall system or by the school, and roles within the hierarchy are fixed and determined for a long term (Aviram, 2000, p. 338).

- **Lococentricity**: the unconditional dominance of the principle of unity of time and place (Aviram, 2000, p. 338).
"If computers are merely add-on activities or fancy worksheets, where is the value? Technologies must be pedagogically sound. They must go beyond information retrieval to problem solving; allow new instructional and learning experiences not possible without them; promote deep processing of ideas; increase student interaction with subject matter; promote faculty and student enthusiasm for teaching and learning; and free up time for quality classroom interaction— in sum, improve the pedagogy" (Rodney S. Earle, 2002, p. 6).
• "Although active, constructive learning can be integrated in the classrooms with or without computers, the characteristics of computer-based technologies make them a particularly useful tool for this type of learning" (Roschelle et. al., 2000, p. 79).

• "Schools should be computerized not because of evidence that computers do the educational job better, but because new ICT’s are both the representation and the medium of the new way of doing things in the postmodern world, and schools, if they want to survive, have no option but to adapt themselves to the era in which they function" (Aviram, 2000, p.333).

• **21st century pedagogy**
"Models of successful technology use combine the introduction of computer tools with new instructional approaches and new organizational structures. Because the American educational system is somewhat like an interlocking jigsaw puzzle, efforts to change one piece of the puzzle—such as using technology to support a different kind of content and instructional approach—are more likely to be successful if the surrounding pieces of teacher development, curriculum, assessment, and the school’s capacity for reform are changed as well" (Roschelle, 2000, p. 90).
“Maximizing our investment in technology requires a clear vision of our goals and well-developed plans for achieving them” (Kleiman, 2000, p. 1).

“For technology to be used fully in K–12 schools, significant changes are required in teaching practices, curriculum, and classroom organization” (p. 6).

“Technology plans tend to turn technology into a goal in and of itself, and to separate it from other educational goals and plans. But technology is a tool, and technology planning is like planning for the purchase and use of construction tools—the first step is to design the structure to be built” (p. 6).


Videos Cited

► A Vision of Students Today
http://www.youtube.com/watch?v=dGCJ46vyR9o

► 21st century pedagogy
http://www.youtube.com/watch?v=l72UFXqa8ZU&feature=related
Appendix D
Education and Web 2.0

Introduction

This website introduces educators to Web 2.0 and their educational applications. While many of our students have readily integrated Web 2.0 into their lives for social purposes outside of school, schools themselves have been slow to recognize the value of these technological advances for educational purposes. Web 2.0, a term coined at a technology conference in 2004 to describe a new World Wide Web, holds many possibilities for addressing the educational needs of today's students. (T. O'Reilly, What is Web 2.0?) The new Web 2.0 tools, such as wikis, blogs and podcasts, can be used to enhance the development of skills, such as collaboration, critical thinking, problem solving and creativity, skills essential for success in the 21st century. (W. Richardson, Blogs, Wikis, Podcasts and Other Powerful Web Tools for Classrooms)

This website was created by Maria Donovan (marisdonovan2005@yahoo.ca) on March 20, 2008 for LIBR 500: Foundation of Information Technology at the University of British Columbia.
Education in the 21st Century

The 21st century is an era characterized by rapid change. Technological changes have contributed to the globalization of our society and our economy on an unprecedented scale. We are moving away from the old model of capitalism to a new capitalism, characterized by global markets, global networks, and information rich environments (B. Cope and M. Kalantzis, Multiliteracies, 10-11).

As students embrace their futures outside our institutions, it is imperative that we facilitate the type of learning that will lay the ground work for a successful future in this global society (C. Wallis and S. Steptoe, How to Bring Our Schools out of the 20th Century). The basics of yesterday will no longer be sufficient for tomorrow's future!

Technology has changed the way that our economy is organized and businesses have to be flexible enough to respond and adapt to this constantly changing technology. In this era, information is the key and within this type of work place, the organization needs to be such that, it is able to maximize the knowledge and skills of a team of workers (Kapitzke. Information Literacy: A Positivist Epistemology and a Politics of Outformation, 48). New capitalism requires people who will be able to work together and collaborate as team players because, as James Paul Gee puts it, "a team can behave smarter than any individual in it by pooling and distributing knowledge" (Learning for the Future, 65). Individuals who are adept at networking and recreating themselves according to the demands of the market are going to do well in a work environment where technology is contributing to fast changing global markets. The speed at which businesses are able to access information, are going to affect the level of success they are able to achieve. In addition, young people are going to have to be able to be creative problem solvers and successful communicators. The need for these higher level thinking skills has important implications for education itself (Gee 65). In order to obtain these higher order thinking skills, educators are going to have to adapt the curriculum to include activities that promote, critical thinking, problem solving, collaboration and creativity.

In addition to higher level thinking skills, the technological advances that have accompanied this new capitalism, have also brought with it a need for people who are fluent with the new literacies that have emerged. In the past, educators defined "literacy in terms of alphabetic practices only" (Selfe and Hawisher, Conclusion: Stories from the Untited States in the Information Age 233). However, in the 21st century, literacy includes new media texts. Learning these new literacies have become additional requirements for people who want to compete in a rapidly changing global market. This has an important impact upon educational pedagogy and how we teach literacy in the future. "It is necessary", as Burkhardt states, "in today's evolving world to prepare students to be proficient using technology in an academic and thought-provoking manner, to think critically, and to become creative problem solvers—in other words, to develop 21st century literacy skills" (Sheffield, Caroline, Technology and the Gifted Adolescent: Higher Order Thinking, 21st Century Literacy, and the Digital native 2).
Students in the 21st century?

Marshall McLuhan was quoted in 1967, as saying that “Today’s child is bewildered when he enters the 19th century environment that still characterizes the educational establishment where information is scarce, but ordered and structured by fragmented, classified patterns, subjects, and schedules” (A Vision of Students Today). This appears to be even truer today. As seen in the video, Education Today and Tomorrow, by Tom Woodward, many of today's classrooms still reflect a model of education developed in the industrialized era, where pencils, chalk and chalk boards are the main tools used. When you consider that most students will be entering a work force where digital technologies are key tools, it is clear that we are falling behind the times! As stated by Beto Gonzalez, appointed by the U.S. Department of Education as the deputy assistant secretary for vocational and adult education in 2005, “The landscape has changed, and we owe it to our students to adapt our goals and strategies to the new environment in which we find ourselves.”

Today's students, often referred to as “Millennials”, a term used to describe people born within the new capitalism era (after 1982), have grown up in a world immersed in technology (James Paul Gee, Millennials and Bobos, Blues Clues and Sesame Street: A Story for Our Times, 54). It is suggested in the article, Learning and Knowing in Networks: Changing roles for Educators and Designers, “that educators [should] adopt tools and approaches to teaching and learning that reflect the experiences and communication habits of millennials. These tools include blogs, wikis, social networking, podcasts, online video, and virtual worlds” (George Siemens, 6-7). While many of our students are using these new web 2.0 technologies for social application, educators have not yet widely harnessed the potential of these tools for educational purposes. It is in the best interest of our students that educators look at ways in which this technology can be used as a means of obtaining 21st century skills.
Web 2.0

What is Web 2.0?

Web 2.0 is a term that generally refers to new technologies that are changing the way in which we use the internet. It is defined in Wikipedia as “a trend in World Wide Web, and web design, a second generation of web-based communities and hosted services such as social-networking sites, wikis, blogs and folksonomies, which aim to facilitate creativity, collaboration, and sharing among users.” (http://en.wikipedia.org/wiki/Web_2.0) The original concept of the web, envisioned by Sir Tim Berners-Lee just over a ten years ago (Tim Berners Lee on the Semantic Web), has continued to evolve. Since that time, there has been a "gradual emergence of a new type of practice" (Alexander, B. Web 2.0: A New Wave of Innovation for Teaching and Learning? 8). The World Wide Web has become less dependent upon the web master to update the web pages and has become more of a shared responsibility between the webmaster and the users to keep the web informative and engaging (Web 1.0 vs. Web 2.0). The difference between the original concept, now referred to as Web 1.0, and this new phase in internet development (Web 2.0) is shown in the following chart created by Kathy Schrock:

- **Web 1.0**
  - static Web pages
  - the use of search engines
  - surfing

- **Web 2.0**
  - Web-only applications
  - Information served to the user
  - user interaction with online information

Essentially, as discussed in the YouTube video, Web 2.0 by U Tech Tips, Web 2.0 is thought of as a "more dynamic and interactive web" than the original web design, web 1.0.
M. Kalantzis and B. Cope state that, “Not only do schools need to make themselves relevant to the new social world they inhabit, but they should seize the moment, by taking this opportunity to reinvent themselves and reinvigorate learning” (N. Yelland, Shift to the Future, x). It is this vision of embracing new web 2.0 technologies for the purpose of promoting learning, that is capturing the attention of educators and concern citizens, that will help prepare students for a future in a world that is characterized by global change. However, “Although a considerable number of colleges and universities have begun to explore the potential,” says W. Richardson, “K-12 educators are just now beginning to contemplate, in significant numbers, the ways in which this new Internet can enhance their own practice and their students’ learning” (Richardson, 2006, 5). Teaching and learning with Web 2.0 will take a shift in perspective by those who teach and those who are taught.
Students born into this generation are the first to grow up in a world immersed in internet technology. "They have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age." (Prensky, 2001). Technology is not something that is foreign to these learners. Combining these new learners (referred to as "digital natives") with new tools (Web 2.0) can lead to a very powerful learning experience, for which will appropriately prepare them for this new, highly technical 21st century world in which they must live and work in. David Warlick, in A Day in the Life of Web 2.0, writes "The latest powerful online tools can be harnessed to transform and expand the learning experience." (2006) (http://www.techlearning.com/shared/printableArticle.php?articleID=193200296)

Web 2.0 represents important new ways in which the internet is used. No longer is the internet, just a place to locate information. The new Web, referred to as Web 2.0 or the Read/Write Web, is a place where people can create, collaborate, publish and share information with others. It is both user-centered and encourages participation. (Solomon, Web 2.0: new tools, new schools) Web 2.0 tool can help develop the higher level thinking skills that students are going to need in the 21st Century.
There has been a proliferation of web 2.0 tools in recent years (for a complete list of these go to http://www.go2web20.net/). Wikis, blogs and podcasts are among the three most commonly used. These tools are free and available to anyone who has a computer and access to the internet. Free access to these has allowed for “new avenues for collaboration and communication.” Due to the participatory nature of Web 2.0, “the most important point is that it harnesses collective intelligence” (Solomon and Schrum, Web 2.0: New Tools, New Schools 46).
What are Wikis?

A wiki, deriving from the Hawaiian word “wiki-wiki” meaning “quick”, is an internet tool, originally created by Warren Cunningham in 1995. It is defined, by Jack M. Maness, as “open web-pages, where anyone registered with the wiki can publish to it, amend it, and change it” (Library 2.0 Theory: Web 2.0 and its Implications for Libraries, 2006). They allow people to collaborate with others in changing the content of the page. The Common Craft video, Wikis in Plain English, explains that wikis are useful at coordinating group communication. These websites, says Lee Le Fever, allow a group of people to, not only to view the page, but also to edit and save the changes made to the page. When the users want to make changes, they simply click the edit key, transforming the web page into a document ready to be edited. When the changes have been made, the user clicks the save page and the document reverts back to a web page with the changes made.

Start your own class wiki:
Here are a couple of sites that educators can access on-line to create their own wikis:
• www.pbwiki.com
• www.iot.com
You simply sign up with a site, such as PB Wiki, and choose a password for your class, so that only you and your class will have access to this Wiki.

The following video, PBwiki is easy, from TeacherTube shows how simple a class wiki is to teach and for students to use:


Classroom application of Wikis:

Students who use wikis will not only learn to publish content, they will also learn “to use collaborative skills, negotiating with others to agree on correctness, meaning, relevance and more” (Richardson, Will. Blogs, Wikis, Podcasts, and Other Powerful Web Tools for Classrooms 65). Here are just a few ways in which W. Richardson suggests that you can use wikis in the classroom:

1. Create an online text that you and your students can both contribute (collaborative writing projects)
2. Create your own class Wikipedia
3. Create a wiki to post PowerPoint presentations or video and audio files

As with all on-line technology, internet safety and etiquette are important to teach to students. The video, PBwiki Helping Educators, discusses the importance of discussing digital citizenship and what is and what is not appropriate to put on a wiki. One teacher comments that because what students are writing is publically visible, the students are motivated to do things the “right way” (ie. be polite, be nice and be democratic)

What is Wikipedia?

When one hears the word “wiki”, one might think of something called “Wikipedia.” Wikipedia is an on-line encyclopedia that was created with the wiki technology (Standen, Amy. A Glorified Whiteboard: Classroom Wikis make students the Experts), where registered users can write or edit articles at anytime. It is described by one writer as “the point of convergence for the self-taught and the expensively educated” (Baker, Nicholson. The Charms of Wikipedia). As mentioned in the
article, Perils and Pitfalls of Wikipedia, because anyone can write and edit its content, there is controversy as to its reliability. However, there can be educational purpose to exploring and discussing the controversy. This article lists three applications for using Wikipedia:

1. Discuss the pros and cons of using Wikipedia (ex. reliability of sources, copyright and permissions)
2. Discuss the downfalls of using a single source for research
3. Discuss copyright issues

Perhaps the “Wikipedia controversy” would make a great blogging topic!
Blogs

What are "blog"?
"Blogs", a term short for "weblogs," are “online journals, published chronologically, with links to and commentary on various issues of interest" (Eugene Barsky, Introducing Web 2.0: weblogs and podcasting for healthy librarians 35).

Why use Blogging?
While many students may already be blogging, they may only be using these tools for social purposes. However, blogging can be “places of critical thinking and analytical writing and reflection.” (W. Richardson 46)

The following video, Students and Blogs, there are many reasons listed for why educators should use blogging in their classrooms:


Among the many reasons listed, are that blogging gives students opportunities for collaboration, creativity, communication, skills useful for their digital futures. It also mentions that blogging is motivating, engaging and empowering to students.

Getting Started
E. Barsky, from the University of British Columbia, comments that blogs are very simple to get started because the software will create the webpage for you (no knowledge of HTML coding is necessary). The following list for getting started with classroom blogging is taken from the book, Blogs, Wikis, Podcasts, and Other Powerful Web Tools for Classrooms, by Will Richardson:

1. Have students read some examples of good weblogs (see “Find New Blogs” at www.bloglines.com/topblogs)
2. Create your own class blog (see creating a class blog)
3. Post a question each day to get them started
4. Model expectations for responses
5. Let students leave posts on your class blog
6. Be clear about your expectations (can negotiate with students)
7. Respond by commenting back when appropriate (link to other students' posts and ideas by weaving together excerpts)

To create your own class blog, you can go to the following site:

https://www.blogger.com/start

This website was created by Maria Donovan (mariadonovan2005@yahoo.ca) on March 20, 2008 for LIBR 500: Foundation of Information Technology at the University of British Columbia.
Internet Safety

A major concern amongst parents and educators has been internet safety. However, “Preventing youngsters from using new digital technologies,” says M. Gura and B. Percy, “amounts to separating them from the world they are growing up in and in which they must learn to find their way” (Recapturing Technology for Education: Keeping Tomorrow in Today’s Classroom 44). Educators need to find ways to keep our children safe without filtering out (or denying access to) the very technology that may open the doors to learning. Nancy Willard suggests that, “Today’s “digital natives” (young people) know that many “digital immigrants (adults) do not understand the Internet. They will dismiss fear-based messages as evidence that adults fear what they do not understand. Young people will be interacting with strangers online. They and their parents need to know how to find safer places to engage in these communications, limit access to personal information, evaluate the trustworthiness of anyone met online, the danger signs, and how to meet safely.” (Nancy Willards’ Weblog, Center for Safe and Responsible Internet Use, My Review of I-Safe, March 13, 2008)

Teacher’s can show their students the important of password protection and how to choose sites that offer more safety features. For example, David Warlick’s Class Blogmeister (http://classblogmeister.com) is a site developed specifically for classroom teachers to blog in a controlled environment (Solomon and Schrum 156).

It is important for teachers to send home an “Acceptable Use Policy (most schools do this already)” that outlines acceptable internet usage, what students will be doing on the internet and a place for parents to give their permission for its usage. Also, before you have students participate on the Web, you will also need to communicate with the parents further, as to the precautions that you will be taking to provide support for their children (Richardson 49). For example, you will be teaching children not to publish their personal information about themselves and others, in the same way that you would teach them not to talk to strangers. It is also a good idea to only use first names or pseudonyms when publishing on the web.

As children grow older, they will inevitably access the computer technology more and more (whether parents like it or not)! Our world is now immersed in technology. It’s not only in the schools, but in our homes, public libraries and very likely, in many other places that your children frequent (like in the homes of your children’s friends). With this in mind, it seems more logical to teach our children to work safely with the technology, than to try and keep them away from it!
While computers are present in most schools today, they are not being utilized to their full potential. The majority of educators were not born into this digital era. Therefore, many of them maintain a view of education that is not compatible with technology-driven world. "It is very easy to find examples where teachers and administrators approach new technologies in ways that constitute these new technologies as simply more recent forms of established tools, rather than as constitutive elements of new ways of doing things and new ways of being" (Knoebel and Lankshear, New Literacies and the Challenge of Mindsets 54) For example, some teachers use computers to simply find information or to type out a final product of an assignment, as opposed to "developing, critiquing, analysing, or even becoming technically proficient with new literacies (21st Century skills)” (Knoebel 55) It is not enough to use new tools in old ways.

In our schools today, discusses Mark Gura and Bernard Percy, "while technology should currently be providing powerful support for teaching and learning, it remains, for the most part, an add-on, an enrichment item to which most students rarely have access" (Recapturing Technology for Education: Keeping Tomorrow in Today’s classrooms xi). Educators need to address this situation and reconnect our schools to our modern world, if we want our students to be successful in this 21st century environment. However, “the single biggest problem facing education today,” states Marc Prensky, “is that our Digital Immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language” (Digital Natives, Digital Immigrants 2).

In order for educators to correct this situation, they must gain "a clear understanding of how technology can fit easily and naturally into the day-to-day work of our classrooms.” (M. Gura and B. Percy, xi) Educators need to become familiar with the new Web 2.0 technology, in order to explore and evaluate its educational applications within the school environment. The only way to do this is to experience these tools firsthand.

In Kathy Schrock’s slideshow presentation for educators, Shedding Light on Web 2.0, she says that educators need:

• to find each other and mentors
• to join groups and collaborate
• to share evaluated resources
• to have access to information
• to be able to conference
• to reflect on the use of information

Within the process of creating content to publish, with the help of web 2.0 tools, students are developing and using skills that will not only help them with current applications, but will also help prepare them for technology not yet created. It is the processes of collaboration, creation, critical thinking and cooperation that will prepare students for life and work in the 21st century. It is up to educators to begin using web 2.0 tools in a meaningful way in order to make learning relevant to our students. So what are you waiting for? Web 2.0...the future is happening right now!
Education and Web 2.0

References


Nancy Willard, MS., J.D, is the Director of the Center for Safe and Responsible Internet Use. Preparing Students for a Web 2.0 World - Learning from the Business World February 26, 2008 • 1 Comment

http://csriu.wordpress.com/


External Links

Audio Podcasting (video)

Audacity
http://audacity.sourceforge.net/

Blogger
https://www.blogger.com/start

Find New Blogs
http://www.bloglines.com/topblogs

David Warlick's' Class Blogmeister
http://classblogmeister.com

Did You Know? (video)
http://www.youtube.com/watch?v=pMcf12YDm2U&feature=related
Education and Web 2.0

Education Podcast Network
http://epmpodcastnetwork.org/

Education Today and Tomorrow by Tom Woodward (video)
http://www.youtube.com/results?search_query=education+today+and+tomorrow+by+tom+woodward&search_type=

Go2web20
http://www.go2web20.net/


Information R/evolution (video)
http://www.youtube.com/watch?v=4CV05HyAbM

Jotspot Google
http://www.jot.com/

KPN: Collaborative Online Learning With Podcasting
http://www.teachertube.com/view_video.php?viewkey=7c7cecc6f84d207d7c88

Nancy Willards’ Weblog, Center for Safe and Responsible Internet Use, My Review of I-Safe, March 13, 2008
http://csriu.wordpress.com/

PBwiki
http://pbwiki.com/

PBwiki Helping Educators
http://www.teachertube.com/view_video.php?viewkey=455b3f09a282e0d496f

Perils and Pitfalls of Wikipedia

Shedding Light on Web 2.0 (video)
http://kathyschrock.net/web20/schrock_web20.pdf

The Machine is us/ing us (video)
http://www.youtube.com/watch?v=6gmP4nkOEOE&feature=related

3 Steps for the 21st Century Learners (video)
http://www.youtube.com/watch?v=pQ0u3bY5m2

Tim Berners Lee on the Semantic Web (video)
http://www.youtube.com/watch?v=mVFY2bGh6Bc

Tim O’Reilly On What Is Web 2.0? (video)
http://www.youtube.com/watch?v=CQibri7gplM&feature=related

Web 1.0 vs. Web 2.0

Web 2.0 by U Tech Tips Video
http://www.youtube.com/watch?v=nsatZTRJQ5w

Wikis in Plain English by Lee Le ever, 2007 (video)
http://www.commoncraft.com/video-wikis-plain-english

Wikipedia
http://en.wikipedia.org/wiki/Web_2.0

Willowdale Elementary School###, Animal Acumen, article posted # ######March 3, 2008,
http://staff.prairiesouth.ca/~cassidy.kathy/podcasts/animals.mp3.

Notes
This website was created using Kompozer.
Images and Clipart
The banners and buttons on all of the web pages were created at Flaming Text Buttons, Logos [very classy looking logos & buttons].
http://www.flamingtext.com/

The clip art is from Royalty Free Photos.
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This website was created by Maria Donovan (mariadonovan2005@yahoo.ca) on March 20, 2008 for LIBR 500: Foundation of Information Technology at the University of British Columbia.