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# What if ?

## TECHNOLOGY

## in the 21st Century Classroom

AN OPSBA DISCUSSION PAPER

# What if ?

## *Technology in the 21st Century Classroom*


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Ontario Public School Boards' Association
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# What if ?

## *Technology in the 21st Century Classroom*

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## WHAT IF: A 21ST CENTURY CLASSROOM SCENARIO

THE 20 STUDENTS FILING INTO NORA SMITH'S HISTORY CLASSROOM EACH GRAB A RANDOM NETBOOK OFF THE RACK AND HEAD TO THEIR ASSIGNED FOUR-STUDENT TEAM STATION. Jack sits at his assigned space, plugs his netbook using a username and password. The central server's database recognizes that Jack is in history class and identifies the three other members of his student team. The screen on Jack's netbook is populated with several pieces of relevant information, broken down into windows. First, there is the overview of today's lesson. Next, Jack's personal, class-related documents and multimedia files are listed. Finally, there is an instant messaging box that connects Jack to his team and to their teacher. Jack notes that today's lesson is titled "The Life of Louis Riel."

Smith begins the class with a 15-minute streaming video from the Ministry of Education's server that provides a brief overview of Louis Riel's life and political legacy. The video is displayed on an interactive whiteboard at the front of the class and on each netbook. She pauses the video several times, engages with the students to identify key learning points and has a brief open discussion before continuing. Using text and thumbnail photography, the netbooks and the whiteboard display a running summary of the learning points identified by the students during their discussion. (Scenario)

Jack's team and the other teams in the class move on to working on presentations. The results are lively and reflect the students' ease in integrating technology into how they learn: One team presents a video capture of a war simulation video game called Medieval: Total War recreating a surprisingly realistic version of the Battle of Fish Creek. Another team uses a cellphone camera to recreate the trial of Thomas Scott and Riel's argument for allowing his execution. Still another team creates an MP3 rap about Colonel Wolseley's incredible journey and eventual confrontation and routing of Riel's troops at Upper Fort Garry. The rap, assembled with basic music mixing software, has the classroom roaring with laughter. Jack's group is well on its way to completing a 10-page PowerPoint presentation that incorporates images and video. The team knows that this is not an exercise in cutting and pasting, but a task involving creating the framework for an argument and using multimedia and Internet sources to back that argument up. The team also knows that all references used in the presentation must include an HTTP link citation. Using the Ministry of Education streaming video index, YouTube, Google Images and Wiki searches, the team is soon able to weave together an impressive summary of Riel's trial and execution. With typical grade 8 enthusiasm, the team argues that Riel's "martyrdom" was an important event in the evolution of Manitoba's identity as a new province in Confederation, and uses Wiki and Government of Canada sources to back up their point, including an easily located 1992 federal bill citing Louis Riel as "the founder of Manitoba."
Smith grades the groups based on how well they have created a coherent argument and how well they incorporate original multimedia content, using appropriate Web-based resources to present and back up the argument, properly citing sources and providing evidence of effective teamwork. Not for the first time, she wonders whether traditional grading methods are even relevant to this new style of engaged learning. After class it takes her mere moments to enter the grades and post the projects to an online forum accessible to all students in the class as well as their parents. (Scenario excerpt – full text, page 25)



# What if ?

## *Technology in the 21st Century Classroom*

**Learning to Change, Changing to Learn.**
www.youtube.com/watch?v=tahTKdEUAPk

### INTRODUCTION: DISCUSSION PAPER RATIONALE

This paper asks the question:
"How can schools continue to be connected and relevant in the world of the 21st century?" It explores the relationship between the use of technology and the scope for increasing the quality of teaching and learning.

It offers food for thought about the role of using tools that are meaningful in the lives of students to stimulate increased engagement in the learning process. Current research underway in Canada "What did you do in school today?" is finding that intellectual engagement declines dramatically among students in grades 6, 7 and 8 and continues to decline, at a slower rate, in grades 9 through 12. What is emerging is a significant link between students' learning environments and student disengagement, dissatisfaction with their schooling experience, high drop out rates, and difficulties in transition to post-secondary education.[1]

**Change the culture of education and infuse it with the same technologies for learning that our students use for living.**

**DAVID GOLDSMITH**
TRUSTEE,
LAMBTON KENT DSB

This paper suggests that effective learning environments that engage students in modes of exploration and knowledge-building that are relevant to their experiences are a significant part of the solution.

At a time when the economy is shrinking, when there is again great pressure on the education dollar, is it not more critical than ever to be strategic about allocating resources in ways that will make the greatest impact?

**"Rapid technological change, global competitive pressures and new patterns of work are demanding a more sophisticated set of transferable skills such as problem-solving, communication, decision-making, teamwork, leadership, entrepreneurship and adaptability."**[2]

The story that emerges from this paper shows students taking charge of their learning in the "connected" classroom and strengthening, every day, their command of this sophisticated set of transferable skills. The authors of this paper ask all those who are concerned with education in the 21st century, and who are interested in how schools engage with students to prepare them for success in a highly connected world, to join the discussion.

The scenario (opposite)is happening in hundreds of classrooms in Ontario today. For other classrooms it is the future. To realize that future is a challenge we welcome because it is our opportunity to examine and remove the institutional and organizational barriers in the school system that stand in the way of relevant and connected schools.

Ontario Public School Boards' Association
Leading Education's Advocates

# THE 21ST CENTURY STUDENT:

# *Evolution to Revolution*

**Knowledge Ontario**
www.knowledgeontario.ca

## EVOLUTION

THE STATSCAN GENERAL SOCIAL SURVEY 2000 found that the majority of urban and rural youth, some 96% in both cases, reported using a computer during the preceding 12 months.[3]

It is now 2009.

Students who were consulted in the preparation of this paper peg the regular use of computer devices among their peers at 99%. The recent study *Young Canadians in a Wired World II*[4] found that the Internet is the main choice of students searching for information for school assignments. This ranges from 62% of Grade 4 students to 91% of Grade 11 students. Toddlers are using "Skype", a form of online videoconferencing, and are picking out the icons on the screen to call their grandparents in another province.

**PEEL DSB**
The Board has established a web-based tool for teachers to create class web sites. These sites are available "anywhere, anytime" to students, teachers, and parents. Teachers can use them in class to access resources. Homework assignments and announcements can be placed on the site for students and parents. Parents find this communication more timely than monthly newsletters. Classroom resources, such as URLs, can be placed on the class web site; students can then easily find the URLs when they go to the class site in the computer lab, at the library, or at home.
**Laura Williams** Chief Information Officer

**SIMCOE COUNTY DSB**
The Board has provided video conferencing capabilities to all its elementary and secondary schools. The use of the equipment continues to grow with many conferences involving other schools and locations around the world. For example, a Simcoe County school, a school in the United States and a school in Iraq are video conferencing as part of the Machinto project; an international ICT initiative aimed at delivering picture books from schools around the world to refugee students in war torn countries.
**Greg Elliott** Manager of Information Services



Private virtual schools are setting up business in Ontario and, with the approval of the Ministry of Education, are offering high school credits through "anytime, anywhere" learning.

We are educating a generation of children and youth who have no memory of a world without the Internet, without instant access to information, without an array of media at their fingertips. Innovative use of technology is proliferating in our schools but it is not matching the stage of development of our students and it is not offering a clear and preferred alternative to the flexibility of virtual schools.

In a very real sense this challenge is not about machines and devices; it is about what learning should look like. For young people today learning occurs in a wider space and time. How do we in the school system facilitate learning in this wider sense? Students learn as much from peers as from teachers.

The role of teachers encompasses being an expert guide – a very critical guide. The students interviewed for *Young Canadians in a Wired World II*[5] were adamant that despite their preference for the Net, they want to learn in school: "How can we tell if the information we find on the Net is true or not?" They want the skills to critically evaluate the validity of this information rather than accepting it as true.

These concerns could be expanded to draw in character education in the use of technology.
"How do I behave in a social network?"
"What is the impact of a digital footprint?"
"What does ethical use mean for me?"

However, many students feel that when they come into school they have to "power down" to fit into an environment that offers fewer options for learning than are available in the life they live outside of the school. This can erode students' perceptions of the relevance of education as they experience it in many schools today.

**TORONTO DSB**
*The Academic Workspace* is a powerful integrated ICT (Information and Communication Technology) platform that engages district-wide collaboration and interactions among students, teachers, parents and school staff using 21st century ICT tools. It is inclusive and extends the teaching and learning moments from the day-time 5 hours face to face; to on-line; to home, anytime anywhere learning with built-in tools to support web conferencing and meeting rooms.
**Jacob Chan** General Manager, Information Technology

**YORK REGION DSB**
*Advanced Broadband Enabled Learning* (ABEL) is a program that uses a combination of technologies, blended program design, content and expertise to impress upon teachers, faculty and students the educational value of ICT for teaching and learning. Guided by its vision to transform learning by connecting people ABEL has worked collaboratively with post secondary institutions, businesses and school districts since 2002 to provide the practical and theoretical knowledge to assist school districts to leverage ICT for teacher professional growth and student achievement. Teachers engage in "job-embedded" learning, students use broadband networks and ICT to develop inquiry-based projects, to communicate with each other and to connect with the real world, and dynamic school leaders mentor each other as they study "current research" and develop pedagogy for the twenty-first century learner.
**Janet Murphy** Manager, Innovative Learning Solutions

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Leading Education's Advocates

## REVOLUTION

We currently do and always will put a high premium on literacy. For clarity, let us use this definition of literacy: *"Literacy involves the development of a continuum of skills, knowledge and attitudes that prepare all of our learners for life in a changing world community. It begins with the fundamental acquisition of skills in reading, writing, listening, speaking, viewing, representing and responding. It becomes the ability to understand, think, apply and communicate effectively in all subject and program areas in a variety of ways for a variety of purposes."*[6]

Literacy is constantly evolving and we need to examine how it evolves. If literacy is the ability of the individual to articulate ideas in the main medium of society, how relevant are our current approaches? Paper and pen still have their place but there are other powerful tools for literacy that are more relevant to the world in which students live and learn.

**TRILLIUM LAKELANDS DSB**

*The Virtual Learning Centre* is an online school and is known provincially as an early adopter of things like synchronous instruction with streamed audio and video, interactive shared whiteboards, online libraries of full text and streamed media, podcasting and voice threads. Students take online courses for a variety of reasons and our feedback is that these courses are well designed, rigorous and incredibly important options for students who may have special needs, illness or life conditions that preclude them from attending bricks and mortar schools. Report card and attrition data coupled with online surveys suggests the program is the key to achievement for many students.

**Diana Scates** District Principal



The classroom of the 21st Century remains filled with human interaction but the dynamics are changed; the teacher is playing a different role and the student has a different level of ownership. Students are taking more responsibility and control over their learning.

Connected, relevant learning is not about bolting technology on to traditional models of teaching. 21st Century learners are adept at multi-tasking, grabbing information in bites, customizing it for themselves, and are engaged in sharing and building more knowledge all the time. They don't think of the media they use as "technology."

The measure then isn't about how many devices or pieces of software are employed; it is emphatically about engaging students and guiding them to be far-reaching in their inquiries as well as critical and principled in their use of the knowledge at their fingertips; it is about creating stimulating school environments and these may not always be contained within four walls.

**"21st century students need the skills to create, analyze and collaborate."**[7]

**KAWARTHA PINE RIDGE DSB**

We have been integrating web 2.0 technologies into various classrooms in the board where champion teachers have taken it and made use of blogs wikis and podcasts. These have been done at all grade levels. Professional Learning communities have been very effective in developing teacher buy in.

**Robert Andrews** Superintendent of Education

Ontario Public School Boards' Association

Leading Education's Advocates

# THE 21ST CENTURY TEACHER:

# *Evolution to Revolution*

e-Learning Ontario
www.elearningontario.ca

## EVOLUTION

A HIGH PROPORTION OF TEACHERS in Ontario classrooms graduated from teacher education programs in an era when technology, if it was a factor at all, was seen as an esoteric bell or whistle. Many have incorporated some of the advantages of the wired world into their personal lives and from there into their professional practice in the classroom. Many have not. Most faculties of education have not rushed to embed the resources of technology in their programs and professional development offerings for teachers, more often than not, adhere to traditional class and workshop modalities.[8] Technology as part of teacher education was not on the agenda four years ago. Faculties are realizing they need to help teachers be better prepared. The notion of elective courses on use of technology is old school thinking. The pressure is to embed technology in effective classroom strategies. A common challenge for faculties of education is that their pre-service candidates do not often have access to hook up notebooks in their practicum schools where the host teachers are teaching in a traditional manner.

**DSB NIAGARA**
The first large-scale delivery of video in this format in Ontario, our video streaming initiative has turned into offerings of over 800 titles from our Media Centre. Students have access to the titles at school on the WAN, while classroom teachers have access to all streamed videos both at school and at home for lesson preparation purposes. Video is completely on demand; available when it is needed to support student learning.
**David Miller** eLearning & ICT Consultant

While recognizing that there are many teachers who are experienced and gifted mentors, it is also a fact that new teachers, who have little recollection of a world without the conveniences of an array of software and the ever-available Internet, sometimes enter their practicum experience brimming with ideas about integrating multi-media approaches in their teaching only to encounter resistance and be told by their mentors: "That's not the way we do it here."

Technologies of the 21st century are still very much an administrative tool for creating report cards and recording marks and attendance. They are only now beginning to emerge as a convenient, "anytime, anywhere" classroom teaching tool and a way to access professional development.

Yet there are many examples (see previous section) in schools across the province of teachers who have introduced exciting innovations in the classroom, engaging students and challenging them to dig deep and use all the resources of the digital world to create rich and professional pieces of work. Often that teacher becomes the expert or champion for the school or a group of schools, working hard with little additional reward to impart enthusiasm for the potential of embedding technology in teaching practice.

Teachers in many schools are using technology to support different learning styles and engage all learners, offering developmentally appropriate learning experiences through a variety of media. What is missing is a comprehensive set of guidelines for all teachers that describe how they should use technology to: promote innovative thinking and collaborative work; incorporate rich digital resources into student learning; employ varied assessment methods that can in turn improve learning; model ethical practices in the digital age and strengthen their own professional development.

## INPUT FROM THE FIELD

**THAMES VALLEY DSB**
With the necessity of electronic report cards and use of email for communication, this has certainly increased the base level of skills in all staff members.
**Valerie Neilsen** Superintendent of IT Services

**KAWARTHA PINE RIDGE DSB**
There is currently a growing awareness that ICT can augment student engagement. Those who have discovered the benefits of working in a connected world are moving forward in their own implementation of technology-based instruction projects. Interest among teachers is strong with regard to use of ICT when it is shown how it can help kids to be successful and when supported with PD and by administration.
**Robert Andrews** Superintendent of Education

**NEAR NORTH DSB**
There are pockets of excellence that do exist in our board especially with the use of Educational Technology (ET), which is apparent in classroom hubs. ET is being used to assist with differentiated instruction and individualized instruction.
**Kelly Brown** Superintendent of Schools and Program

**RAINBOW DSB**
Teachers are embracing ICT in their instructional practice. Various incentives, including a computer in all teaching areas in all schools, encourages the use of ICT in the classroom. In 2007, an incentive that ensured that all schools had at least one SMART Board, inspired a renewed interest in technology. Teachers voluntarily attend after-school workshops on various topics of ICT on a regular basis, demonstrating a continued interest to expand their knowledge of ICT instructional strategies.
**Jean Hanson** Director of Education

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## REVOLUTION

When it comes to ease with technology, the hierarchy in the classroom is inverted – students are, by and large, more proficient and comfortable in the digital environment than the teacher. And that's okay – it is what one expects as the upcoming generation embraces technologies in an unprecedented fashion. The role reversal where the student is the expert offers a tremendous opportunity for a democratic learning community in the classroom. The level of engagement is high and the environment is rich with peer to peer learning dynamics.

The Classroom Scenario that forms the sub-text for this Discussion Paper addresses the changing role of the teacher. That role involves developing in students skills that equip them to learn how to learn, a skill that will go on opening doors for them all their lives. With the digital resources available to them, students have access to oceans of knowledge. What they need to acquire is the critical skills to assess what is reliable, authentic information and separate this from unfounded opinion. They need the expert guidance of teachers to be able to make these judgements and to construct reasoned, coherent representations of what they draw from the information available to them. As noted in the *Young Canadians in a Wired World II* study, students want to be able to turn to their teachers to develop their authentication skills.

The students who contributed to this Paper highlighted other experiences they value in being in a classroom setting with a teacher:

*"In school you can communicate with classmates and have a connection with the teacher. The downside of e-learning is that you don't have the discussions with the rest of the group together in class. Students that take courses by e-learning don't even know what a seminar is."*
Carmen Fang

**TRILIUM LAKELANDS DSB**
Generally, the capacity of teachers with ICT skills is not keeping pace with the need to achieve active integration into classrooms and the gap is widening. There are a number of factors responsible for this: school leadership, allocation of resources, training and, most importantly the great number of Ministry driven initiatives that impinge on training. As more technologies emerge and as student skills and expectations increase, teachers feel overwhelmed and left behind. So, rather than viewing ICT as integral, it is viewed as external, additional and daunting. The level of teacher use of ICT varies greatly from school to school, and from class to class. It depends not only on the skill of the staff, but the leadership and initiative that has been taken in the school. Some teachers have effectively integrated ICT into the curriculum while others are using computers as an add-on activity, if at all.
**Diana Scates** District Principal

**YORK REGION DSB**
Currently we are hearing that administrators and teachers want more site-based and participant driven professional learning opportunities. This feedback comes from the District's learning networks and their site and family-based literacy foci. As a result York Region is developing and implementing a blended learning strategy to support job-embedded continuous learning, and as the 2008-2009 school unfolds this strategy will be expanded to include many professional learning opportunities. We are applying an ICT strategy to the delivery and development of professional and leadership learning programs that are targeted and intentional
**Janet Murphy** Manager, Innovative Learning Solution



Students value the learning that unfolds through face-to-face dialogue and debate with peers that is moderated by a teacher who brings expertise to the subject.

Teachers will need active and ongoing support in adapting to this changing role. Working with already "connected" students and blending a rich array of easy-to-access resources into the teaching-learning dynamic brings curriculum to life, engages students, and creates a learning environment where everyone has an active role and shared responsibility.

One necessary pillar of adaptation involves embedding the efficient use of technology in the curriculum, abandoning the notion that, in the digital world we live in, technology is separable from learning. Think of the redundancy of using an atlas as the resource for a geography assignment in an age where textbooks cannot keep pace with changes in nation boundaries and we have Google Earth at our fingertips. It is arguable that learning is not efficient or relevant if we are not using the technology tools available to us.

Another necessary pillar is professional development and how it is delivered. Technology creates opportunities for job-embedded professional learning. Applying software in an authentic content-based context must replace teaching the nuts and bolts of how software works. We talk of anytime, anywhere learning for students and the same is true of teachers. This involves having online professional learning programs rather than event-based congregated Professional Development. The latter is shown to have little return on investment; the former models what learning today and tomorrow looks like. The Ministry of Education has been working in this direction and currently have the tools, such as 45 minute webinars, to put teacher Professional Development on line.

**GREATER ESSEX COUNTY DSB**
There is a strong desire, for the most part, from teachers wishing to use ICT in the classroom. This year saw increasing use of blogging, podcasting, class webpages, internet use and literacy in the classrooms.
**Mary Guthrie** Chief Information Officer

**BLUEWATER DSB**
General level of ICT use is in the middle but growing every year. Interest is skyrocketing. There is more and more demand from teachers for equipment, software and bandwidth... Internet usage has grown by 1100% in the last 4 years.
**Michael Morgan** Chief Information Officer

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## THE 21ST CENTURY LEADER:

# *Leaders of Teaching and Learning*

TVO
www.tvo.org

AS A SOCIETY AND A SCHOOL SYSTEM we have substantially arrived at the capacity for integrating technology into teaching and learning as described in the scenario that underpins this Discussion Paper. Students already inhabit this world. They even come to school with the technology on them. Certainly the current generation of Notebook devices allow for personalized and collaborative learning and they are closing in on being as affordable as traditional textbooks. However, challenges remain in the form of institutional and organizational barriers in the school system at the board and provincial level.

If we accept that there is no debate about how technology has revolutionized the way we live, it should be an easy step to embracing how technology should revolutionize what learning looks like not only today but five and ten years out. This entails a vision of program revitalization, technology embedded in curriculum methodology and expectations, a wireless learning environment that moves us from desktop to mobile devices, leveraging what is already available in the world of information and communications technology where lateral learning thrives and social networking is a force for democratic change.

**Effecting Change through Social Networking**

**The provisions of the Ontario Bill that would have restricted the number of passengers a young driver could carry were successfully challenged by a massive campaign launched primarily by young people through Facebook.**

DECEMBER, 2008

It entails a revisioning as well of our structures, how we build buildings, how we structure timetables, how we integrate curriculum streams.

A key component of building and realizing the vision is leadership at the local school board level. Sustained change that is supported by teachers, parents and students requires that each board of trustees and each Director of Education together articulate a clear vision of the learner and the learning process in the 21st century and a clear vision of effective teaching practice in the digital age.

## PRACTICAL REASONS TO ADVOCATE FOR CHANGE

It is tempting to turn this on its head and speculate about what will happen if we do not embrace change. A graphic illustration of this would be the North American automotive sector which in 2008 has revealed itself to be a dinosaur that has ignored its environment and failed, not only to anticipate what its customers would want, but even to respond to them when they made their wants known through their defection to small, environment-friendly automobiles made in Asia and Europe.



In the public school sector, failure to change creates the risk of increasing numbers of students disengaged from traditional school learning environments as the disconnect grows between how young people live and the modalities for learning offered to them. Carmen Fang, a Grade 11 student commenting on her experiences in a traditional classroom, said: *"You can see it quite clearly – the students who are the most advanced in their use of technology are the students who are the most disengaged in the traditional classroom."*

Student engagement is fundamental to maintaining a viable and vibrant public education system. The Ontario government has accorded singular priority to the value of education. It embodies this in three goals that inform all its decision-making in this sphere:

- Higher levels of student achievement
- Reduced gaps in student achievement
- Increased public confidence in publicly funded education

The government has set a goal of achieving a high school graduation rate of 75%. Since the goal was set, improvements have been evident. A significant factor in these improvements was the level of investment that has been made in the Student Success (SS/L18) initiative. Why has this initiative shown positive results? Dr. Charles Ungerleider, the Principal Investigator in the recent preliminary evaluation of this initiative puts it this way: "[the strategy] appears to be succeeding in providing a more respectful and responsive school environment for students and increased opportunities for them to remain in and benefit from secondary schooling in ways that provide a foundation for work and study following high school. In particular, the SS/L18 strategy provides more choices for students not bound for university, more chances to make up lost ground better recognizing the maturation process of adolescence, and more supportive and individualized attention through program and transition planning." In the section of the evaluation study that focuses on its strengths, the following observations are made:

> "The SS/L18 Strategy is challenging Ontario's traditional secondary school culture in a number of positive ways:
>
> - All pathways are valued;
> - A new focus on student engagement, and those who leave school because they are disengaged;
> - Focus is on the students and the subject matter, not just on the subject matter;
> - The importance of getting students off to a good start in secondary school, including individualized timetables...
>
> A further strength of the SS/L18 Strategy is that it is very non-traditional: it is grass-roots engaged, it encourages innovation at the local level, and it places great emphasis on collaboration, networking, and sharing."

The rate of improvement in graduation rates is beginning to level off, and it is worth examining whether the factors that have made the SS/L18 Strategy successful need to be more broadly applied across the entire school system with a focus on the embedding of technology in learning experience and teaching practice. It is arguable that this goes to the heart of widespread student engagement in the 21st century. SS/L18 allows students to make strong connections between learning and the world as they experience it. It also, in the words of Dr. Ungerleider, "demands new notions of teachers' professional responsibilities, and (is) at odds with traditional timetabling, planning and staffing routines that are often engrained in traditional or contractual relations to the detriment of students."

These concepts echo what is evolving in the world of information and communications technology and how it contributes to "anytime, anywhere" learning. What is evolving is an evident momentum among students and many teachers for learning that is grass-roots engaged, encourages innovation at the local level, and places great emphasis on collaboration, networking, and sharing. While SS/L18 is centred in secondary education, the report speaks to the formative base provided at the elementary level. The values are applicable across the school system.

## ENLARGING THE VISION

We referred earlier to institutional and organizational barriers in the school system at the board and provincial level. While the successes with the SS/L18 strategy demonstrate that barriers can be overcome to make way for necessary and desired change, it requires visionary thinking, concerted effort, redirection of resources and a great deal of good will.

It will be necessary to examine these barriers.

**If at first the idea is not absurd, then there is no hope for it.**

**ALBERT EINSTEIN**

## LEADERSHIP IN TECHNOLOGY: *New concepts to consider at the Board level*

- How can we promote broad-scale planning and leadership for excellence in the integration of technology at each school so that the "bubbles of excellence" that exist in some schools and classrooms become the norm across the system?
- What is the optimum balance of out-of-school/online/e-learning and in-class learning and what are the successful practices already in place?
- What is needed for all boards to be able to offer blended, collaborative learning through the use of web-based tools?
- Can we find ways to open up technology systems restraints?
- Can we have a system that allows students to use for learning the technology devices they are already wearing?
- Can we afford to delay investing in universal access to broadband width that ensures media-rich content for all students?
- Can we build an open capacity to connect school to school, board to board, board to post-secondary institution?
- Can we develop a secure network that allows anything to be downloaded safely such as open source software (Sketch Pad, Audacity, Photostory)?
- Can we have parallel networks with the business side of the system secure and the student learning side open?
- Can we develop operating norms that promote systems that are secure and safe, based on high quality and good research and values of acceptable use and that strive for a goal of "Anything, anywhere, any time"?
- Can we have interoperable systems that will accommodate both the technology initiated by the board and the technology students bring to school?
- Can we promote integration of Curriculum, Information Technology and Professional Development departments in every school board so that there is common vision and aligned supports for learning?
- How can we set up an approach to coaching for teachers in technological literacy and online Professional Development that is shared amongst boards?
- Can we examine the most cost-effective way of providing infrastructure such as using university systems as the backbone?



- How do we build student input into strategic planning on technology decisions, not just at the site but at the system level, given that integrated support for technology needs to include student expertise?*
- How do we further engage partnerships that add value, e.g. through broad scale provincial purchasing?

*If boards were to issue a common assignment to students and had students identify the resources and technology they used to get an answer, the list would be both comprehensive and informative for strategic planning on technology decisions.

## A PROVINCIAL PERSPECTIVE: WHAT'S NEEDED

As early as JK children are using technology at home. It is part of their daily lives but hard to find it in elementary classrooms. While the use of technology increases through middle school and is significant in secondary schools, there is still an element of "spray and pray" in how resources are allocated, supported and used. There is a need to recognize the fundamental importance of the effective use of technology to learning and student engagement of a comprehensive provincial strategy.

Driven by the value of student engagement, this strategy would embrace:

- an understanding that engagement underlies achievement;
- equity of access to the resources;
- flexible vision of technology that goes beyond computers to delivery of services to the device in the classroom. (More and more, tools will be web-based so the vision has to leave behind the notion of owning the device in the classroom.);
- collaboration among boards and school systems for operational efficiency that ensures effective expenditure of tax dollars;
- embedding in the curriculum the practice of using the most effective tools for teaching and learning so that printed textbooks,

## SOME BOARD COMMENTS ON LEADERSHIP

### HASTINGS PRINCE EDWARD DSB

Ultimately if a program is to succeed and flourish in a school, the school's administration needs to be supportive.

**Matt Norton** Senior IT Services Manager

### TORONTO DSB

The Board's Academic Workspace (AW) environment is highly engaging due to its built-in web 2.0 tools, unified communications capability (e.g. live presence and web meetings) and accessibility to information of value (existing and new) to support the roles of stakeholders. The environment fosters innovative practices. A system-level process can harvest these innovative practices, assess and endorse those truly exemplary practices for sharing and implement them system-wide. Central staff can also leverage the same environment to engage leading edge practices or implement Ministry directives. This environment encourages both bottom-up and top-down approaches and in doing so, nurture a culture of inclusiveness, empowerment and ownership.

**Jacob Chan** General Manager, IT

### DURHAM DSB

ICT leadership in schools should come from the students, teachers, and administrators using ICT in the classroom.

**Martyn Beckett** Director of Education

### WATERLOO REGION DSB

ICT leadership is a shared responsibility at all levels from the Ministry, Boards, Principals, central support staff and teachers. Strategies need to be comprehensive and coordinated to maximize impact and change. Strategies must limit the optional aspects of implementing ICT to have a lasting impact on our students.

**Mark Carbone** CIO

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blackboards, iPhones, Smartboards, etc. are valued as current tools and reflective of what is being used in mainstream society;

- promotion of job-embedded, content-based "anytime, anywhere" professional development for teachers to support technological literacy;
- adjustments in the funding formula to redistribute funding to reflect the changes in learning environment and tools necessitated by how technology has revolutionized everyday life.

## LEADERSHIP IN TECHNOLOGY: *New concepts to consider at the provincial level*

- How do we advocate for deeper levels of coordination that embrace all stakeholders including faculties of education, textbook publishers, the technology industry etc.?
- How are funding lines reshaped to allow for 21st century learning environments – online resources replacing textbooks, virtual classrooms?
- Do we need new terminology to replace Information and Communications Technology to change the perception that curriculum and learning are discreet endeavours and that technology is an optional layer?
- Will the Ministry of Education extend the options enjoyed by accredited private schools to the public school system, e.g. ability to offer online programs outside Ontario?
- How will we provide for student-initiated change in a time when students are already making "out of the box" choices?
- For students, up to fifty per cent of information and review doesn't need to take place face to face, the interactive learning, seminar-style discussion does – how will we validate an environment that is already calling for a change in where learning takes place? (This is not about a face-to-face setting versus online. Acquiring all credits online is good for 10% of the population, e.g., elite athletes, youth coping with depression. Hybrid blended learning, a combination of online and classroom helps marginalized kids.)
- How can we keep pace with change in a way that engages students not only in learning but in the human connections and foundation for social cohesion that the public school system provides?
- Is there a need to identify and promote standards or competencies for the use of Information and Communications Technology in teaching and learning, standards that would be embedded in curriculum expectations? (Some school boards have already done this, e.g. adoption of ISTE standards.)
- How can the province address the barrier to equitable opportunity presented by lack of access to hi-speed internet that still exists in many places?
- How are we preparing students to acquire the skill set that is vital to success in an e-learning environment? (Time management, organization, problem-solving, critical analysis, focussed reading).
- What can be done to replicate the successful consortia developed for transportation and purchasing so that there is greater collaboration and operational efficiency among boards in developing SIS/Payroll/Accounting systems?
- Boards are in the same business, reporting to the same funder; it is ineffective to duplicate back-end infrastructure. Through the efforts of OASBO, the Ministry could, for example, support the implementation of a communications backbone with a provider such as ORION, and set up data centres with support for a pyramid of software.



## OVER TO YOU

# *An Invitation to the Discussion*

**Learning Connections**
www.abelearn.sharpschool.com

### WILL THE SCENARIO BECOME THE REALITY?

THE PREMISE UNDERLYING THIS DISCUSSION PAPER is that the public education system is in danger of being left behind by the students it serves.

The ideas and questions we offer in this paper are intended to stimulate a discussion that will help to further define where schools need to go to fulfill their role in preparing students for the society they live in today and will live in tomorrow. So the question is: How can we make this happen? In our research and discussions with school board staff it became clear that while there is innovative practice to support the integration of modern technology into the operations of the board, schools and classrooms, it is not because of a provincial vision or plan. It is because of leadership which is often teacher and board staff generated.

We encourage you to examine the issues raised in this paper about defining a vision for the schools of the province and developing a plan for moving forward. This will raise questions about allocating resources to address a range of needs. these include: connectivity and bandwidth, provincial licensing of software, standards to promote consistency, support for pre-service training and ongoing professional growth needs of staff, portals to further engage parents, and, overall, initiatives that encourage and support innovation and leadership throughout the entire education system.

### GETTING STARTED

Although the classroom scenario in this Discussion Paper is fictional, it is a composite of many approaches to education that are emerging in Ontario classrooms right now, approaches that seamlessly blend the dynamic options offered by technology with rich earning experiences that engage students. The key is to be found not in any one particular technology, but in a willingness to update the classroom environment to reflect the communication technologies.

**Mark Bailey** Trustee, Upper Grand DSB

Ontario Public School Boards' Association
Leading Education's Advocates

Parents particularly will welcome a voice in how the local school and local school board work with them to strengthen their involvement in the education of their children. We live in a world where, frequently, both parents work outside the home and lone parents struggle to balance many pressures – all of them have limited supplies of time and energy. Schools increasingly will need to be able to offer what the parent in the following scenario regards as a lifesaver:

She is able to find a moment almost every day to check in on class websites of both her children. Here she can see the homework that was assigned. She can click on her son's name (Tommy) or her daughter's name (Emily) and access a special parent portal where she inputs her unique password. It gives her a timeline for outstanding homework and future homework. She can also log in to classroom instruction to understand exactly what has been taught so that she can better support her children's learning from home. She can access a log of marks to date and see for herself how each of her children is doing. The assessment plan is available so she knows each of the assessments completed and/or planned and also their relative importance. This helps her to focus her kids toward aligning their time commitments appropriately. She can also access their class schedules online with test dates included which helps her to make sure that she steers clear of important school dates when booking orthodontic appointments for the kids. There is even a place for two- way communication with the teacher so that if an issue comes up the teacher can let her know and vice versa. She can also access Tommy's IEP online and make notes to herself about possible input she would like to provide at the next teacher conference.

**Flora MacDonald** Parent, York Region DSB

The use of Internet-based tools and applications offers a powerful communication link to bring parents into the classroom, to share information with their children's teachers and to be part of their life at school. We need to hear from parents not just about what they want for their children in today's schools but what will help them to be fully engaged in 21st century education.

It is hoped that you – the educators, parents, students, community members and individuals inspired by the possibilities for education in the 21st century – will offer your advice and comments at **ITinSchools@opsba.org**. The ideas you contribute and the ideas presented through the classroom and parent scenarios in this paper will set the agenda for a much-needed provincial Round Table on "Connected and Relevant: Schools for Today and Tomorrow."

## APPENDICES

# *School Board Comments on Leadership and Coordination at the Provincial Level*

ALL RESPONDENT SCHOOL BOARDS SUPPORTED THE IDEA of province-wide standards for integration of information and communication technology in teaching and learning. Some specific comments were:

Provincial leadership is required if standards are to be developed. A review of standards established by a number of Ontario school boards shows a wide variety of priorities. As in the case of eLearning and report cards, the tendency for school boards to develop their own priorities in the absence of Provincial leadership has created an unsustainable patchwork of solutions.

**Bill MacKenzie** ICT Consultant, Upper Grand DSB

Clearly identified standards will impact Faculty of Education teacher preparation programs, identify hiring standards for school districts, and establish instructional practice guidelines for the classroom and for community engagement. Many jurisdictions locally, provincially and internationally have already developed ICT student, teacher and administrator standards based on literate graduate indicators. Developing standards for Ontario may be informed by these already developed criteria. Without clear standards we cannot measure our success and we cannot work towards iterative improvement.

**Janet Murphy** Manager, Innovative Learning Solutions, York Region DSB

Every classroom, whether elementary or secondary, should be funded for:

- internet access
- a warrantied computer
- a shared projection device (such as an LCD projector)
- access to LINUX instructional software

Every elementary school should have:

- document cameras
- a warrantied lab with a shared projection device per 400 students

Every secondary school should have:

- one warrantied lab per 170 students in order to meet curriculum expectations
- 6-10 computers for credit recovery, student support centres, and guidance
- 1 class set of 24 computers in the library for student research

Teachers benefit from:

- release time to learn to incorporate new instructional strategies available only through ICT and web resources
- technology resource teacher support for 1-2 years

**Laura Williams** CIO, Peel DSB

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Use of technology (without being prescriptive as to the type of technology) could be embedded in all curriculum documents (minutes per day is present focus). Rubrics would incorporate several levels of tech, such that appropriate staffing and budgeting for these projects would be easier to justify. Stable, consistent teaching and learning environments: In the past, computers have been allocated to schools based solely on a mathematical formula (ratio of students/computer). While equitable, this process has lead to a mishmash of models and operating systems that can lead to user frustration, problematic support issues, and decreased time on task for learners.
**Dave Miller** Manager, Business and Learning Technologies, Ottawa-Carleton DSB

Making the 21st century learner philosophy as out lined by the Making Gains group a priority message on how technology can support learning in a relevant context for students. The draft library document would also be a good place to start in raising awareness of the loss of relevance of education to students when literacy and numeracy is delivered in traditional formats.
**Robert Andrews** Superintendent of Education, Kawartha Pine Ridge DSB

(Provincially there should be) a mandated ICT document: ICT is currently an 'add-on' in the curriculum documents. All of these documents state "wherever possible, teachers should incorporate ICT …" However, the choice of whether to use ICT is generally left entirely up to the teacher. Given the number of new initiatives and directions we are asking our schools to embrace, ICT needs to be viewed as an efficiency which supports other initiatives.
**Diana Scates** District Principal, Trillium Lakelands DSB

There needs to be standards developed for technology to support curriculum delivery. With proper infrastructure, boards and schools can develop a sound, sustainable and secure network that would allow staff and students to utilize their own technology, i.e. phones, PDA's, laptops, Ipods, etc.
**Wayne Toms** Manager, IT & Planning, Limestone DSB

While we have adopted the NETS (National Educational Technology Standards) within our board, and have provided release time for the development of lessons to support this, it would be helpful to have these standards (or another appropriate set) promoted and endorsed at a provincial level. In this way, boards would not all be "doing their own thing", and we could benefit from the work done by each other.
**Valerie Nielsen** Superintendent of Education, Thames Valley DSB

Provide boards with the money for infrastructure (firewalls) that allow schools to become hubs where parents and students can enter the building and access all aspects of the educational community. Schools presently service and allow access for computers owned by the school – we have to develop the means by which when a student enters a building with their own computer we can allow access to a vibrant, connected educational community. Promote virtual learning centers or hubs based out of schools that serve the school and community.
**Kelly Brown** Superintendent of Schools and Program, Near North DSB

Moosonee District is located in the remote area of James Bay. We would like to see laison staff lured by The Ministry to visit schools and provide staff with support to incorporate technology in teaching and learning.
**Janette Corston** Vice-President, Moosonee P.S.

In other provinces, there is leadership and infrastructure provided by the government so that there is equitable access to ICT by students and staff; in Ontario infrastructure dollars are enrolment driven which results in wide variance. Until the systemic inequities are addressed and boards have equal access to network infrastructure at reasonable cost, it is unrealistic to establish standards for ICT in the classroom.



Currently, it is not possible to replicate the wonderful ICT projects taking place in urban centres in Renfrew County. We do benefit from and appreciate access to provincially licenced software for classroom use. One future example of provincial coordination could be a provincial licence for Microsoft Office which is used in classroom and business applications. This would reduce costs for everyone.
**Eleonor Newman** Director of Education (former), Renfrew County DSB

Leadership for ICT needs to be central and coordinated amongst departments within districts. Traditionally, ICT is viewed as a distinct entity as opposed to central to all of the work that we do. As such, there are pockets of energy and pockets of money to support ICT. This results in a fragmented and haphazard deployment. It also calls into question longer term sustainability and hampers our ability to remain current and forward thinking. The leadership needs to remain in the districts not at the ministry, but leadership in policy and resources at the Ministry level are clearly key.
**Diana Scates** District Principal, Trillium Lakelands DSB

The province should work with the College of Teachers to increase the emphasis on learning and using technology for new teachers. Our new teachers, although more technologically literate than some of the more experienced teachers, are still not, as a whole, at the level needed to maximize the use of technology in the classroom.
**Greg Elliott** Manager, Information Services, Simcoe County DSB

We would like to see ICT presented as simply "good teaching" and included in association with the many instructional strategies and tools available to teachers. On-line training supports for teachers that delve into what embedded technology looks like in a classroom would be useful.
**Lisa Grothier** Manager, Information Systems Services, Upper Canada DSB

Ontario needs a 5 year Strategic Plan for ICT in Education
**David Miller** eLearning & ICT Consultant, DSB Niagara

Support the SEA process by establishing provincial standards for hardware and software for students with special needs. Currently, school boards have independently developed their own standards. Like report cards and eLearning, provincial leadership in this area is required.

Advocacy for improved bandwidth to rural communities in the province will support equity of access for all students and educators by partnering with organizations such as ORION

As the Curriculum Review Process continues, opportunities for technology integration should be explicitly considered, with consideration given to recommendations for the types and quantities of technology required for each course

The Learning Management System used by eLearning Ontario provides an ideal platform for the delivery of professional learning courses for educators and students

Embed technology within professional learning opportunities. Currently provincial agencies such as the LNS leverage the Internet through Curriculum Services Canada to reach out to schools. Using a variety of modalities from webinars to podcasts, teachers can engage in professional learning in their environment.
**Bill MacKenzie** ICT Consultant, Upper Grand DSB

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ADDITIONAL AREAS IDENTIFIED FOR PROVINCIAL ATTENTION INCLUDED:

Documents or videos showing best practices for the use of OESS licensed software would make terrific professional development materials. Best and safe practices for the use of Web 2.0 to enhance the classroom would be helpful as well. Currently, many boards block some of this cutting edge capability in the name of safety. Unfortunately, the fallout of this is that students will learn to use the technologies on their own without the discipline of a formal approach. This leads to the student not being aware of bullying, harassment, or privacy issues. A province-wide discussion should be convened to resolve the question of content-blocking.
**Mary Guthrie** CIO, Greater Essex DSB

Provincial online course delivery through one centralized online school; provincial training modules for key OSAPAC applications; provincial framework for teacher competencies to use ICT; tighter provincial standards for software licensing (OSAPAC) in that fewer applications with similar functionality are licensed; provincial standards and purchasing of key educational systems (e.g., SAS, financial, communication/email, HR, etc. — currently there is massive waste when different boards choose and implement different products).
**Bruce Smith** CIO, Halton DSB

High Speed connectivity (10 MB or higher) to all Ontario schools/and communities; the identification of specific technologies that support specific learning styles; the alignment of technology infrastructure to curricular needs for all of K-12...
**Matt Norton** Sr. IT Services Officer, Hastings Prince Edward DSB

We would like to see the Ministry provide additional current, and up to date software through OSAPAC to boards across the Province. A number of the software selections are dated and do not perform well with new computer platforms.
**Larry Hope** Director of Education, Keewatin-Patricia DSB

Our Board would like to see: Continuum Model for Literacy with ICT across the Curriculum (i.e. Manitoba model ); provincially led negotiations with vendors for ICT related products and services; provincially developed training and support materials for OSAPAC software; development of a provincial committee to address educational computing needs at two levels - academic requirements and administrative requirements (work in conjunction with ECNO and OASBO); connections to MISA, ONSIS and Student Success Initiatives.
**Garth Vanstone** Manager of IT, Lambton Kent DSB

Access to digital text is very important to the success of many of our students. There needs to be a push from the province to demand that publishing companies provide digital versions of their learning resources in order to provide accessibility to a more diverse group of students.
**Lisa Grothier** Manager, Information Systems Services, Upper Canada DSB



# APPENDICES
## CLASSROOM 2.0:

## *Technology Engages Student Learning*

**Advanced Broadband Enabled Learning (ABEL)**
www.abelearn.ca

BY MARK BAILEY

IN ONTARIO'S CLASSROOMS, NEW TECHNOLOGIES HAVE BEEN HARNESSED to allow students, educators and parents to explore resources, work and study effectively and communicate collaboratively. This all comes with a relatively inexpensive price tag: for instance, the netbooks (mini-laptops) used by the students can be purchased in bulk for less than $200 each. Although the middle school in the following article is fictional, the lessons and procedures are real, and the equipment is available right now. Let's see how it all works.

As they do every time, the 20 students filing into Nora Smith's grade 8 history classroom each grab a random netbook off the rack and head to their assigned four-student team station. Jack sits at his assigned space, plugs his netbook into the power cord built into the desk and logs in wirelessly to the central server, using a username and password. The central server's timetable database recognizes that Jack is in history class and identifies the three other members of his student team based on information that Smith submitted earlier in the year.

The screen on Jack's netbook is populated with several pieces of relevant information, broken down into windows. First, there is the overview of today's lesson. Next, Jack's personal documents and multimedia files related to the class are listed. Finally, there is an instant messaging box that connects Jack to his team and to their teacher. Jack notes that today's lesson is titled "The Life of Louis Riel."

Smith begins the class with a 15-minute streaming video from the Ministry of Education's server that provides a brief overview of Louis Riel's life and political legacy. The video is displayed on a SMART Board, a popular brand of interactive whiteboard, at the front of the class and on each netbook. She pauses the video several times, engages with the students to identify key learning points and has a brief open discussion before continuing. Using text and thumbnail photography, the netbooks and the SMART Board display a running summary of the learning points identified by the students during their discussion.

Once the video has ended, Smith provides the students with their task for the remainder of the class: pick one of the key learning points identified during the discussions and create a short presentation explaining how that learning point had a significant impact on the development of either the province of Manitoba or Canada as a whole. Jack and his team discuss what topic they should explore. Within moments, they note on the whiteboard at the

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front that the Red River and Northwest Rebellions have already been taken by other groups. To remain original, Jack and his team choose Riel's trial, and Jack enters the pick on his netbook, which is immediately displayed with the other picks on the SMART Board.

Meanwhile, from her office, Ruby Jones, the vice-principal, notes on her workstation that Smith's class has just transitioned from instruction to project work. She leaves her office and heads to the classroom for a prearranged visit with the teacher. As vice-principal, Jones has the provincially assigned role to help facilitate the adoption of information and communication technology (ICT) for the school and the professional development of staff. As per provincial curriculum direction, Jones has focused much of her own PD over the last two years on understanding the new school software. As in previous visits, Jones begins by gathering feedback from Nora Smith about the successes and challenges of the new software. She then walks Smith through the video conferencing software, which is slated for installation the following month. The software and class camera will allow the teacher to invite special guests to the class and to have the students interact with them. The vice-principal points out that through the developing Canadian School Boards' Association ICT Index, Smith can locate educators and others throughout Canada willing to participate in a video conference. The index was created both as a means to encourage collaborative teaching and as part of the strategy to address declining enrolment. Smith wonders who she could have contacted from Winnipeg to say a few words about how Louis Riel is remembered in Manitoba today. Jones finishes up by pointing out a couple of online tutorials that Smith can use as refreshers once the cameras are installed, and then says goodbye to the class.

Smith glances at the "Class Activity" window in her workstation and notices that a couple of students in one team have not used their netbooks in several minutes. "Settle down to work, you two — whatever you don't do now, you will have to do online tonight!" she says. That seems to do the trick. Jack's group is well on its way to completing a 10-page PowerPoint presentation that incorporates images and video. The team knows that this is not an exercise in cutting and pasting, but a task involving creating the framework for an argument and using multimedia and Internet sources to back that argument up. The team also knows that all references used in the presentation must include an HTTP link citation. Using the Ministry of Education streaming video index, YouTube, Google Images and Wiki searches, the team is soon able to weave together an impressive summary of Riel's trial and execution. With typical grade 8 enthusiasm, the team argues that Riel's "martyrdom" was an important event in the evolution of Manitoba's identity as a new province in Confederation, and uses Wiki and Government of Canada sources to back up their point, including an easily located 1992 federal bill citing Louis Riel as "the founder of Manitoba."

Jack is identified as an above-average learner, and has finished up his group work before the end of class. His teacher notes approvingly on her workstation that he has moved on to an extra 'on-demand' module that picks up right where he left it last class. Jack is fascinated by Second World War airplanes and pilots, and has been working his way through a Ministry e-learning module on the topic. A few minutes later the class ends. "Class, tomorrow each team will present their work, so please finish it up tonight if you have not done so already," Smith says. Unlike Jack and his team, a few students will collaborate that evening by remotely logging in from home to finish the project. These teams make plans to meet online; finding their fellow students is never an issue with instant or text messaging, let alone the new classroom software they now use. At home, students can log in and use the same interface that they use in school, and continue seamlessly from where they left off, relying on instant messaging, rather than speaking to complete



their collaboration. Although the terms they use are sometimes unrecognizable to most of us over 30 years of age, the students seem to communicate quickly, comfortably and effectively with shorthand and acronyms like IMO (in my opinion), BRB (be right back) and dozens of others.

The next day the presentations go well, and as usual Smith is amazed at some of the creative uses of technology integrated into the presentations. One team presents a video capture of a war simulation video game called Medieval: Total War recreating a surprisingly realistic version of the Battle of Fish Creek. Another team uses a cellphone camera to recreate the trial of Thomas Scott and Riel's argument for allowing his execution. Still another team creates an MP3 rap around Colonel Wolseley's incredible journey and eventual confrontation and routing of Riel's troops at Upper Fort Garry. The rap, assembled with basic music mixing software, has the classroom roaring with laughter.

Smith grades the groups based on how well they have created a coherent argument and how well they incorporate original multimedia content, using appropriate Web-based resources to present and back up the argument, properly citing sources and providing evidence of effective teamwork. Not for the first time, she wonders whether traditional grading methods are even relevant to this new style of engaged learning.

After class it takes her mere moments to enter the grades and post the projects to an online forum accessible to all students in the class as well as their parents. Parents log in using their own usernames and passwords, allowing them limited access to the school's intranet. Although individual grades are visible only to the parents of the student receiving them, parents are able to view the work done by other student teams. Parents are even able to leave comments, either in private for the teacher or in a space fully accessible to other parents and students; some even seem to be checking the space every night. Smith has noted how the practice of interacting regularly is beginning to visibly strengthen parents' engagement in their children's studies and has facilitated deeper parent relationships in her classroom than she has seen in the past. Smith has no doubt that the new system is an overall net benefit to the success of her students, but is aware that it involves some adjustments. Although she is able to save time recording and tabulating marks, that savings has been offset by the additional interactions with parents, spurred by this new form of electronic engagement. Responding to parent e-mails can often take up a significant amount of her preparation time. Still, the teacher smiles when she thinks back to the three state-of-the-art computers that used to sit idle at the back of her class and the heavy textbooks her students used to have to lug home, and concedes that adapting to the new system of learning has been more than worthwhile for her. It certainly has been for her students; she's never seen such an engaged group having so much fun learning history.

Although this classroom scenario is fictional, it is a composite of many approaches to education that are emerging in Ontario classrooms right now, approaches that seamlessly blend the dynamic options offered by technology with rich learning experiences that engage students. The key is to be found not in any one particular technology, but in a willingness to update the classroom environment to reflect the communication technologies that students already use in their everyday lives.

**Mark Bailey** is a first-term school trustee in the Upper Grand District School Board, serving on OPSBA's education program and information technology ad hoc steering committees. He also owns a small information technology business. He would like to acknowledge the contribution of the IT committee to this article.

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# APPENDICES

## FOOTNOTES

**Page 5, Note 1:** "What did you Learn in School Today?" Research and Development initiative of the Canadian Education Association, Canadian Council on Learning, Galileo Education Network, The Learning Bar with participation by school districts across Canada.
www.cea-ace.ca/res.cfm?subsection=pro&page=wdy

**Page 5, Note 2:** State of Learning in Canada-Toward a Learning Future", Canadian Council on Learning.
www.ccl-cca.ca/NR/rdonlyres/46EA0902-DDB9-4398-AE5E-34CF60844D65/0/SOLR_08_Exec_Sum_E.pdf

**Page 6, Note 3:** "The Daily", June 23, 2003, Statistics Canada

**Page 6, Note 4:** Young Canadians in a Wired World II, Media Awareness Network.
www.media-awareness.ca/english/research/ycww/index.cfm

**Page 7, Note 5:** Ibid

**Page 8, Note 6:** Definition of literacy, Information Communications Technology and the Learner, York Region DSB.

**Page 9, Note 7:** 21st Century Learning Matters:
www.youtube.com/watch?v=2L2XwWg4BY&NR=1
A vision of K-12 Students Today:
www.youtube.com/watch?v= A-ZVCjfWf8
Education Today and Tomorrow:
www.youtube.com/watch?v=Fnh9q cQcUE&feature=related

**Page 10, Note 8:** Nippissing University's Faculty of Education offers an ITeach laptop program. It has been in place for 7 years.

## OTHER TECHNOLOGY-BASED RESOURCES IN ONTARIO'S EDUCATION SECTOR INCLUDE:

- Knowledge Ontario (www.knowledge ontario.ca) a collaboration of libraries, cultural heritage organizations and educational institutions. Its focus is on connecting Ontarians with digital content to support their information and learning needs;
- e-learning Ontario (www.elearningontario.ca). E-Learning Ontario provides elementary and secondary teachers with more resources to engage their students in learning, as well as an opportunity to share teaching resources with colleagues across Ontario.
- TVO (www.tvo.org) TVO is Ontario's publicly funded educational media organization and a trusted source of interactive educational content.
- Learning Connections (www.abelearn.sharpschool.com/cms/One.aspx?portalId=248124&pageId=503377). Learning Connections is a program which is funded by the Literacy and Numeracy Secretariat and is targeted at junior division teachers in 9 school boards throughout the province. This is a strategy to share Professional Development in a medium that is not "event" based and is participant-driven.
- Advanced Broadband Enabled Learning (ABEL) www.abelearn.ca ABEL lead by York University and works with school districts in the GTA, across Ontario and with national partners to provide quality learning programs. It seeks to improve results and transform professional practice through its networks for knowledge sharing and collaboration. This is achieved by using information communications technologies and a research-based approach to develop, deliver and implement new models of teaching, learning and training.



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