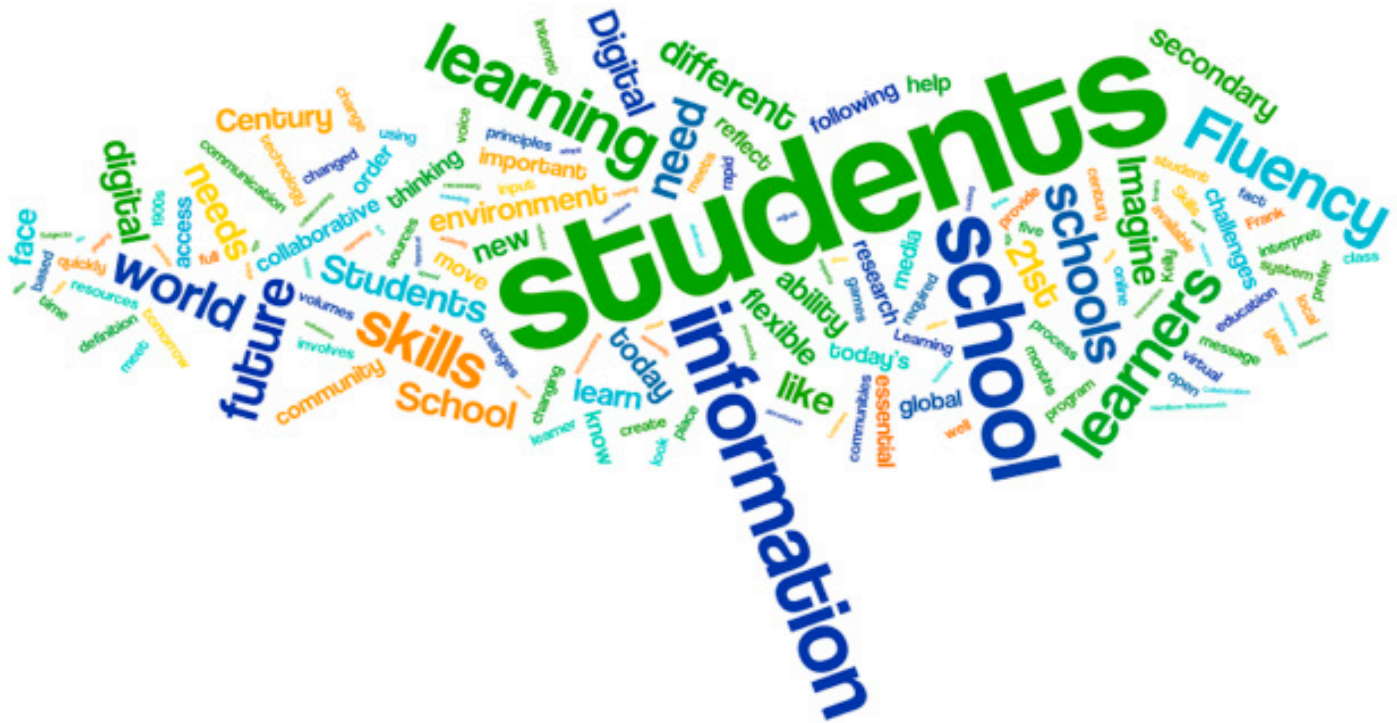




# Education for the 21st Century: Here, Now and Into the Future



- School operating structure is flexible and meets the needs of all learners
- School program recognizes the 21st Century Fluencies that our global economy requires
- Student voice is acknowledged and student needs drive the program
- School is supported appropriately by all members of the community
- School facility is well designed and maintained



## Introduction

Over the last two years Hamilton-Wentworth District School Board embarked on a journey to explore the concept of secondary education in the future. This project involved much public consultation and committee work involving staff and students. An extensive and comprehensive research report was produced that outlines directions for school systems to embrace in order to meet the needs of today's and future learners. While the work began with a focus on secondary education, it became evident that the directions applied to education from kindergarten to grade 12 and beyond. With our global economy shifting, employers requiring a creative and innovative workforce, rapid technological changes occurring daily, and changes in the learner, it is evident that there is a need to redefine education for the 21<sup>st</sup> century.

Education for the 21st Century is a topic that has been explored by a number of groups and organizations. The Ontario Public School Boards' Association asked "How can schools continue to be connected and relevant in the world of the 21st century?" ("What if? Technology in the 21st Century Classroom, 2009), the Partnership for 21<sup>st</sup> Century Skills developed a "vision for 21<sup>st</sup> century student success in the global economy" (Partnership for 21st Century Skills, 2009) and Kelly, McCain and Jukes looked to ensure that there are "no more cookie-cutter high schools" as we refine "teaching for the digital generation" (Kelly, 2008). This is not to suggest that what we have been doing is wrong. Educators have long been responding to changing needs in the classroom. This document addresses a wider sweeping approach to what we need to be doing in our schools, the relationships that need to exist and how instruction must influence construction, if we are preparing students for a new reality...one that hasn't been envisioned yet.

The "catalyst" for this work was a recognition that we needed to ensure that our students graduated from our schools, prepared for the future, a future that is changing at an unprecedented rate. This is a rather simple statement; however, it is an extremely complex and multi-faceted one.

**Consider the following as three compelling realities that highlight the need to embrace changes:**

- **our current education system is based on an out-dated industrial model;**
- **there has been a transformation in how students learn;**
- **technology provides access to a number of authorities on different subjects bringing into question the role of textbooks and how the role of teacher needs to evolve.**



***Schooling today continues to be based on an out-dated, industrial-aged model that does not meet the needs of 21<sup>st</sup> century learners.***

Historically schools have been very traditional and slow to innovate. Our models of curriculum delivery; our school calendar; and our organizational structures date back to the beginning of the 1900's. Schools have been modelled on the Scientific Management theory that reflected the assembly line method of production. (e.g. a subject specialist teacher, teaching the same material in successive periods; students sitting at desks; schools as primary 'sorters' of future career roles). The idea was, much like a car on an assembly line, to create a model of students that would be able to enter the workforce with the same skills. Although in other primary areas of society such as health care, transportation, and communication there has been dramatic changes since 1900, education systems remain essentially unchanged. Often the best rational we can offer for current practice is "we've always done it this way." Consider the 10-month school calendar. It is based on a time when young people were needed in the summer to help harvest crops. Despite the fact that that agricultural model is only needed in some rural pockets of our society, we continue, year after year, with the 10-month school calendar.

***There is a need for schools to remain in sync with the world around them and the learners within them. Students need to be involved in real, relevant experiences that recognize how they learn.***

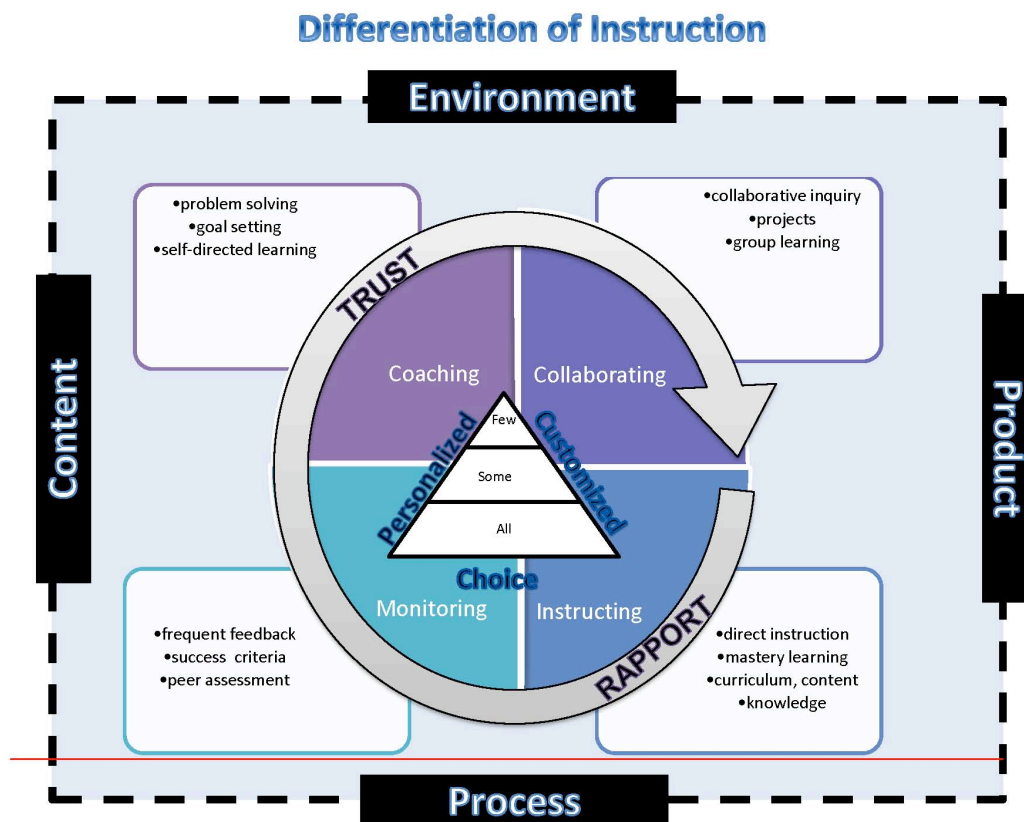
Digital Age students are profoundly different than those who graduated only 10 to 15 years ago. They have developed what is called a "cultural brain" – one defined by the ability to process massive amounts of, primarily, visual and textual information at rapid speed – due to their constant exposure to the digital bombardment that is their everyday experience. (Frank Kelly, 2008) Student brains are different than those of their teachers, administrators, parents and employers – most of whom graduated before the digital age. To harness their current gifts – gifts deemed necessary to compete in the global economy – we must change how we educate on every level. "We cannot carry on preparing students for the farms and factories of yesterday while the world jumps to light speed with biotechnology, nanotechnology, neuro-technology, global high speed wired and wireless networks, and incredibly powerful personal portable devices. Schools must prepare kids for the world of tomorrow – the world where they will spend the rest of their lives" (Frank Kelly, 2008).

While the use of technology is second nature and almost instinctive for our students today, it is important to keep in mind the "new" skillset that this automatic use of technology requires. It is not about the "how" but about the sophisticated level of thinking that is required by students when co-creating products or analyzing content for validity or looking for the message within the message. These are the new 21<sup>st</sup> century fluencies that are essential for our graduates. In 2008, the International Association for the Evaluation of Educational Achievement (IEA) released the results of the 2006 SITES (Second Information Technology in Education Study). This report defined 21<sup>st</sup> Century Skills "as the capacity to engage in life long learning (understood as self-directed and collaborative inquiry) and as connectedness (communication and collaboration with experts and peers around the world). Technology is a tool but the underlying thinking to navigate in the digital world is paramount.



The relevancy of the learning for the learner is fundamental. Students are living in a world where information, communication and experiences can be accessed at lightning speed on their cell phones or computers and any youth can be a collaborative developer of ideas and information with an international audience just by accessing the Internet. The Partnership for 21<sup>st</sup> Century Skills would suggest that “education adapts learning methods to meet the demands of the 21<sup>st</sup> century.” This does not imply abandoning what we know makes a difference for students in our classrooms but rather teachers adjusting their “stance” given the needs of the student(s) in front of them. In this way, teachers are best able to respond to the 21<sup>st</sup> century learner. Consider the following model:

## Participating in the Act of Learning for Life



*Teachers play a fundamental role however, it is no longer how much the teacher knows, but how well the teacher can be both a learner and a catalyst for others to be curious and full of discovery.*



Flexible and responsive learning conditions begin with knowing your students in a learner-centred environment. Interventions employed to meet student needs follow a tiered model of essential for ALL students, necessary for SOME students and necessary for a FEW students which are personalized and customized given unique student needs. Within the tiered supports, students engage in strategic choice reflecting the focus on the learner. Within a learning environment characterized by trust and rapport, teachers will adopt varying “stances” given the needs of the learner at that moment in time. The teacher will take on the stances of:

*Instructing* – This is where explicit teaching is required. The teacher is focusing on curriculum content, knowledge and skills.

*Collaborating* – Facilitating students working together, face to face or over distances, recognizing the norms of collaboration among various cultures, engaging in collaborative inquiry, on projects that have meaning for the learner.

*Coaching* – The teacher is supporting the student as the driver of his or her learning. This includes goal setting, problem-solving, practice and self-directed learning.

*Monitoring* – This is the ongoing formative assessment that the teacher engages in in order to determine what the student needs and thus whether there is a need to alter his or her stance. Based upon established success criteria, students engage in peer assessment and frequent feedback from the teacher. Teachers ensure high expectations for all and create conditions that ensure time on task.

A learning environment, with students at the centre, where teachers vary their “stance” given student needs creates a balanced environment focused on students learning for life with attention to content, product and process in the learning.

Technology also requires a teacher to consider his or her stance. The Internet invites a peer-to-peer learning model but also provides access to multiple authorities that can be referenced in order to learn about a particular subject. In fact, it is much easier to get a more well-rounded picture of a particular event than ever before. As well, technology enables learners to be co-learners and co-creators – to comment and share what they know. This requires a need to consider how knowledge is gained and what the purpose of our education system is. Teachers must embrace the various stances and must focus on assessing and supporting student learning and teaching skills that enable students to sift through the incredible amounts of information surrounding them.

The results from *Imagine a School...* (Canadian Education Association, 2006) and *What Did You Do In School Today?* (Canadian Education Association, 2009) repeatedly show that:

- Students want stronger relationships with their teachers, with each other, and with their communities – locally, provincially, nationally and globally. They want their teachers to know them as people.





- Students want their teachers to know how they learn. They want their teachers to take into account what they understand and what they misunderstand, and to use this knowledge as a starting place to guide their continued learning.
- Students want their teachers to establish learning environments that build interdependent relationships and that promote and create a strong culture of learning.

As we call upon educators to shape our learning environments, we must realize the complexity of working within systems that evolved in and for the industrial past. (Canadian Education Association, 2009). Change is never easy, but now is the time. We have a moral imperative to take the necessary steps to ensure that our education system is responsive to the needs of our students.

It is evident that there is a need for purposeful change. In addition, there is also a need to further understand how the landscape of the 21<sup>st</sup> Century is providing a foundation upon which to consider our changes.

## Did You Know?

### *The Future is Uncertain:*

- The U.S. Department of Labour estimates that today's learner will have 10-14 jobs by the age of 38.
- We are currently preparing students for jobs that don't yet exist, using technologies that haven't been invented, in order to solve problems we don't even know are problems yet.
- If you think of it, children starting school this year [2010] will be retiring in 2069. Nobody has a clue what the world will look like in five years' time. And yet we're meant to be educating them for it. The unpredictability is extraordinary. (Sir Kenneth Robinson, 2006)

### *Today's Learner has More Demands and More Competition:*

- According to the Partnership for 21st Century Skills – an organization representing industry, teacher, parent and union groups across North America – even if our students graduate with proficiency in our schools today, they are woefully underprepared for success beyond high school. (Partnership for 21st Century Skills, 2006)
- The leading countries around the world are revamping their educational programs to meet the demands of the 21st Century (Britain, Australia, Norway, Finland). A post-secondary education is now deemed to be essential to success in the labour market. (People for Education, 2009)
- Our learners no longer compete with graduates from Burlington and Niagara for jobs but rather compete with graduates in Mumbai and Beijing. Dramatic



changes are necessary, if we can hope to equip our learners with the skill set necessary to compete in a global economy. (People for Education 2009)

### *Greater and Different Skills Are Required for Student Success:*

- Our economy is shifting away from jobs based largely on physical skills or repetitive tasks to ones that require analytical skills and judgment. (Martin Prosperity Institute, February 2009)
- Of 13 metropolitan areas examined in Ontario, Hamilton has the second lowest rates of individuals between the ages of 25-34 (53%) who have a college or university degree. If our local citizens and our local economy are to thrive, this percentage must be improved. (People for Education, 2009)
- Employers are changing their approach to both recruitment and retention. In short, employers expect adaptability skills at the same time they recognize the need to make work interesting in an effort to keep those they hire. Schools must begin to do the same.
- Top CEO's from around the world were interviewed regarding skills for the future. Noteworthy in their findings is a trend found in many discussions surrounding skill sets of the future; namely, that good candidates for hiring must have both a solid knowledge base and excellent skills that emphasize communication, adaptability, collaboration and self monitoring. (KPMG, 2008)
- The Digital Age has connected our world like never before. This connectivity requires of us a solid foundation in core competencies of Language, Mathematics and Information and Communication Technology ability. However, it is the skills of the workforce that will determine the success of core knowledge and whether or not the economy will grow accordingly. (Rand Report, 2004)
- Gone is the **agriculture age** when seasonal cycles dictated both curriculum and the calendar. Gone is the **industrial age** when factory assembly lines (and schools with rows of desks) created standard sameness for everyone. Gone also is the **information age** when people passively consume large amounts of data. Here is the **Knowledge Age: the Rise of the Creative Class**.

### *Technology is Rapidly Changing Our World:*

- The amount of new technical information is doubling every 2 years. It's predicted to double every 72 hours by 2010. (Did You Know 3.0, 2008)
- Author Marc Prensky (21st Century Fluency Series) calculates that by age 21, this digital generation will have: played more than 10,000 hours of video games; sent and received 250,000 emails and text; spent 10,000 hours on phones; watched more than 20,000 hours of TV; seen more than 500,000 commercials; and spent less than 9000 hours at school.
- Technology is no longer a way to simplify teaching and learning, rather, it must, as Will Richardson implores in a recent blog posting, 'transform' teaching. (Richardson, 2009)



### *Today's Learner is Different:*

- Students today are Digital Learners. Digital learners prefer active, engaged learning. Digital learners prefer processing pictures, sounds and video before text.
- Schools are centres for social interaction. For many students, school is the epicentre of their social life. Greater efforts must be made to ensure each student has an opportunity to engage in both the curricular and co-curricular the life of the school. There needs to be as much resource put into engaging all students as has traditionally been allocated to the elite academic, athlete, musician, artist or drama major. All students need a sense of self-worth and a strong sense of belonging.
- The trend towards life-long learning no longer limits the term 'student' or 'learner' to a discreet and narrow age band. In a changing global economy, everyone needs to be a learner all the time and more often than not that learning will be 'just-in-time' or informal, or experiential.
- Students today come from a variety of backgrounds across all dimensions of diversity. Continued efforts must be made to acknowledge and utilize the experiences or assets that these students bring to their learning environment, as well as to provide needed support in order to enhance all students' prospects for learning, growing, and fully contributing to society. (Education, 2009)

### *School Designs and Facilities Matter*

- The condition of a school can affect students' safety, sense of self and psychological state. (Ed Young, 2003)
- In consultation sessions with HWDSB students, the following were consistently identified as areas of importance with respect to the school facility: tranquil areas; natural light; numerous small, comfortable conversation areas; restaurant style food services; natural elements (i.e. plants, chairs of wood); student art; adjustable furniture; easy access for technology; flexible places for students to work individually and in small groups.
- Consider the research on the impact of colour on learning environments when painting areas of the school. (Pulicolor, 2009)
- The principles of Universal Design for Learning should be considered, specifically related to accessibility and appropriately designed space. Staff should give attention to ensuring all students have a clear line of sight; resources are within a comfortable reach of all students and there is adequate space for the use of assistive devices. (Ministry of Education, 2009)
- Re-visioning of existing school spaces can allow for greater flexibility in usage in order to meet the needs of today's learners.





- No longer can we think of schools as static facilities that are built and then essentially left standing with minor renovations for 30, 40, 50 years or more. New school designs will have to be incredibly flexible to accommodate the shifting demands of the 21<sup>st</sup> century world as it experiences exponential change.” (Frank Kelly, 2008)

### *We Can't Afford To Not Pay Attention*

- The Canadian Council on Learning's report on the cost of dropping out of high school found that a student who drops out can expect an income loss of more than \$100,000 over their lifetime, compared to individuals with a high school diploma (and no postsecondary education); the average public cost of providing social assistance is estimated at over \$4,000 per year per student who drops out or a total of \$969 million; students who drop out are overly represented in the prison population; and a student who drops out enjoys fewer years at a reasonable quality of life. (Hankivsky, 2009)
- The Canadian Council on Learning Study (Ungerleider, 2008) found that of the student survey respondents the majority (56.1%) of students said they plan to go to university after high school; 22.3% plan to go to college; 6% claim that they wanted to work; and 4.6% want to become apprentices. The remaining 11% had not yet decided what to do after high school. (Canadian Education Association, 2009)

## Implications for Today's Learner

If asked to define the word “school”, most Canadians would provide a similar definition based upon a similar experience. The definition would be something like: “School is a place we go for 6 hours a day for ten months of the year to learn discrete subjects like math, English, science and history from different teachers who are experts in their subject areas. Students use textbooks and carry binders. Students follow a bell schedule and travel from classroom to classroom. Desks are set up in rows. Information is often delivered by a teacher who is a subject expert to students and learning occurs as a class. School success is achieving credits toward a diploma.” This definition of school would be similar across generations – from grandparents to grandchildren. Although none of us can predict the future with any certainty, we can recognize that the world and our learner is changing. Today's learner is faced with an increased demand to not only be higher skilled but to be skilled differently. Access to information and resources through the Internet have created a more collaborative world for today's learner but this has also, naturally, created a more competitive world. Today's learners learn differently than the adults surrounding them. There is an impending urgency for education systems and schools to adapt and respond to today's learner and the changing world around us. Challenging and redefining our idea of “school” is a required response to meeting the needs of today's and future learners. So how do we do things differently when we all share the same definition and this definition worked for us? Today's learner and our changing world are demanding something different. Research can guide us in some of these decisions.



Who are the learners of today and how are they different? They have been weaned in a digital world. They do not know a time when the Internet did not exist. They are arriving on the steps of secondary schools with different skill sets that non-digital adults may not even recognize. Skills attained through playing games, using cell phones and surfing the net are not traditional, but they are skills needed to survive in the digital and business worlds. Learners are increasingly visual-oriented. They process pictures, sounds, colour and video before they process text. Networking and collaboration are second nature to them. Digital learners prefer to access information quickly from multiple media sources and to network simultaneously with others. They are more skilled at multi-tasking. They learn “just in time”. They are accustomed to learning that is relevant, active, and instantly useful and fun and they expect instant gratification and immediate rewards. (21st Century Fluency Series).

*Teaching the Digital Generation: No More Cookie Cutter High Schools* attributes the change in today’s learner to new discoveries in brain research. This is the brain’s ability to reorganize how it processes information based on new input. Digital generation students “are being exposed to new kinds of input on a daily basis. Consequently, their brains are reorganizing to handle the digital environment more effectively...Kids are quite literally thinking differently than those who teach them.” (Frank Kelly, 2008). Imagine this learner in our traditional definition of school?

Don Tapscott, author of *Grown Up Digital* (Tapscott, 2008), suggests that technology fundamentally changes learning norms. He compares ‘broadcast learning’ the kind of learning where a teacher dispenses learning to students versus ‘interactive learning’, learning that happens when students actively engage in a topic rather than passively receive information about the topic. Tapscott contends that technology facilitates this shift. If learners are learning differently, it only makes sense that we need to think about schools and teaching differently. Today’s learner and our collective definition of “school” do not align. As educators and school systems we need to reflect on the changes in the learner and begin to explore how we can meet their needs and provide them with access and training in technology and the skills they need to connect with their futures.

Students enter our schools with the skills of how to use technology, it is the thinking and the school structures and processes that need to evolve to support our 21<sup>st</sup> Century learner. A report called, *The Future of Learning Institutions in a Digital Age* (Goldberg, 2009) outlines the principles of:

- Self-Learning;
- Horizontal Structures of Learning;
- Movement From Presumed Authority;
- Networked Learning;
- Lifelong Learning

as foundational to rethinking the future of schools. Some of these principles provide insight into how our digital learners function and how the current school structures need to adapt.

*Self-Learning* - Online learning (whether formal or informal) promotes the use of skills such as discovery, browsing, scanning, hyper-texting and threading; collaborating and



engaging in multiple voices. This means that our learners are more self-directed and that they often have information at their fingertips. Digital learners prefer receiving information quickly from multimedia sources. Digital learners prefer active, engaged learning. This is a significant contrast to the passive learning strategies, such as lectures.

The second principle, *Horizontal Structures* of learning, focuses on the learning process. Goldberg believes that, given the range and volume of information available and the never ending access to information sources and resources, learning strategy shifts from a focus on the information to judgment concerning reliable information, from memorizing information to how to find reliable sources. In short, from learning that to learning how, from focus on content to focus on process (Goldberg, 2009). Digital learners prefer random access to hyperlinked multimedia information. This promotes co-learning and investigation. Critical thinking skills and being able to sift and sort through volumes of information become fundamental skills for learning.

The principle of *Moving From Presumed Authority* tackles the concept that there is no single authority on a subject. Rather it values a collective credibility – the concept of knowledge creation through many authorities. This is a shift to interdisciplinary and collaborative “knowledge creating” and collaborative learning environments in order to address research problems that are multidimensional and complex when the resolution cannot be found through any single discipline. Older, more traditional learning environments were about trusting knowledge authorities or certified experts. Subject knowledge was delivered to learners discretely. New thinking requires us to do this differently. Instead learners seek parallel processing and multitasking. Collaborative learning extends some of the most established practices, virtues, and habits of individualized learning. Skills needed include taking turns in speaking, posing questions, listening to and hearing others out.

*Networked Learning*, however, goes beyond these conversational rules to include engaging in courageous conversations and working together to create short-term solutions when straightforward solutions to problems or learning challenges are not forthcoming. This type of learning dispels the place of competition in learning. “The power of ten working interactively will almost invariably outstrip the power of one looking to beat out the other nine.” Students are networking and collaborating with each other and with experts online at a very early age. In most online gaming, students are using collaborative problem solving to accomplish tasks. There is also an acceptance and appreciation of knowledge-making platforms like Wikipedia. These emphasize the importance of a “collaborative, knowledge-making impulse in humans who are willing to contribute, correct and collect information without remuneration: by definition, this is education.” (Goldberg, 2009)

“It has become obvious that from the point of view of “participatory learning” there is no finality. *Learning Is Lifelong*. With “the increasingly rapid changes in the world’s makeup mean that we must necessarily learn anew, acquiring new knowledge to face up to the challenges of novel conditions as we bear with us the lessons of adaptability, of applying lessons to unprecedented situations and challenges” (Goldberg, 2009) This must be a value encouraged and instilled in our learners. Adaptability, collaboration and flexibility are fundamental skills for the future. This also has implications for



teachers as their role becomes one of co-learner and facilitator of learning in the classroom.

Without knowing exactly what the future holds in terms of employment skills, the most reasonable approach to preparing students today is to err on the side of adaptability. HWDSB Innovation Think Tank participants reinforced the importance of employees that are flexible and willing to travel as a part of their employment. They mentioned the need for ongoing learning and adapting as their work reality changed. No longer are businesses looking for specialists trained in a specific field doing a specific job. Knowledge is emerging so quickly that employees need to collaborate and share their individual expertise to produce holistic solutions. In fact, employers are recognizing that the fast-paced change brought about by the knowledge-based economy is making it more difficult to determine specific needs for the future of work.

It is important to recognize that skills alone are not the answer to a successful life, employment or realizing one's full potential, in the future. As the British White Paper (Department for Schools, Children and Families, Great Britain, 2005) emphasized, there needs to be a balance of fundamental "functional" knowledge (e.g. English, Math, Information and Communication Technologies) coupled with Learning and Personal Skills that put that knowledge to effective use. As learning institutions embark upon infusing 21<sup>st</sup> Century Fluency Skills into the curriculum as supported by differentiated instruction, it must be emphasized that the nature of the curriculum must continue to be both robust and relevant to the students' future needs while using the skill set to deepen understanding of that curriculum and the wider world.

The **HWDSB 21<sup>st</sup> Century Fluency Skills** (adapted from Five 21<sup>st</sup> Century Fluencies, [www.21stcenturyfluency.com](http://www.21stcenturyfluency.com)) are a compilation of these future skills necessary for our students to meet the needs of both society and employment in the 21st Century. In the broadest sense, 21 Century Fluency Skills are thinking and behaving skills. They help to define the "second nature" ways of thinking and acting that all HWDSB graduates will be confident and competent in and that will support their readiness for an ever changing world.

**Solution Fluency** (Problem-solving and Application; Adaptability) is the ability to define a problem, creatively generate solutions, try solutions, review outcomes and modify the plan of action if needed. One must be flexible, willing to alter the chosen path and be open to opposing ideas before working to a solution.

**Information Fluency** (Communication; Information Processing; Reasoning & Synthesis; Critical Thinking and Analysis) is the ability to unconsciously and intuitively interpret information in all forms and formats in order to extract the essential knowledge, authenticate it, and perceive its meaning and significance (21<sup>st</sup> Century Fluency Series). This also involves the ability to communicate face to face and digitally.

**Creativity Fluency** (Creativity; Innovation; Artistic Proficiency) is the process of adding meaning through design, art and storytelling. Form and function become



important. It involves using the imagination to create stories, a practice that is in demand in many facets of today's economy.

**Media Fluency** (Technological Literacy; Critical Thinking and Analysis; Graphic Literacy) involves two components. Firstly, the ability to look analytically at any communication media to interpret the real message, how the chosen media is being used to shape thinking, and evaluate the efficacy of the message. Secondly, to create and publish original digital products, matching the media to the intended message by determining the most appropriate and effective media for that message. (21<sup>st</sup> Century Fluency Series)

**Collaboration Fluency** (Collaboration; Teamwork; Global Citizenship/Digital Citizenship Self Awareness) is the ability to work cooperatively with virtual and real partners in an online environment to create original digital products. Working with others also requires one to be aware of their own role, circumstances and impact of their behaviour. Students must develop cultural proficiency to enhance awareness and understanding of collaborative practices that are shaped and informed by cultural norms. One must practice life-long learning in order to ensure his/her readiness to participate in our changing world. That participation should reflect the principles of leadership, ethics, accountability, fiscal responsibility, environmental awareness, global citizenship and personal responsibility. (21st Century Fluency Series)

These skills must be practiced in a student's schooling experience on a regular basis to ensure they are developed. Educators at all levels of involvement in the school system must consider ways to infuse these skills in daily lessons, extra-curricular activities and community partnership experiences. These skills can serve as a basis for planning lessons, activities and other educational experiences. They are meant to compliment the curriculum. "The Digital Age has connected our world like never before. This connectivity requires of us a solid foundation in core competencies of Language, Mathematics and Information and Communication Technology ability. However, it is the skills of the workforce that will determine the success of core knowledge and whether or not the economy will grow accordingly." (Rand Report, 2004)

Essential to our emerging learning environments is a focus on the student and student learning. Schools must be planned around the learner. So what does this look like?

- The teacher acts as facilitator of learning, guide, and co-learner;
- Instruction focuses on individuals and not group teaching and learning. This enables teachers to meet student needs and interests. Different learning profiles are responded to;
- Students take responsibility and control over their learning;
- Students are active learners, decision-makers and problem-solvers in their learning;
- Teachers are architects of learning, building activities and assessments that provide learners access at different entry points based on their readiness and their prior knowledge and skill;
- Students engage in hands-on authentic learning experiences;
- Learning is not discrete but is integrated across multiple subject areas and is very often collaborative;





- Inclusive learning environments characterized by Universal Design for Learning (universality and equity, appropriately designed space, flexibility, simplicity, safety and accessibility) and Differentiated Instruction (content, process, product).

Our 21<sup>st</sup> century learning environments need to be client oriented and allow for strategic choice within an equity framework. This includes students and parents. As such, strategic choice needs to be provided in as many areas as possible, built upon the foundation of 21<sup>st</sup> Century Fluencies. Consider the following strategic choices in the:

- focus of learning (i.e. a focus on a specific area of interest such as sports or medicine or arts etc.);
- how the student learns (i.e. self-paced, self-directed; project-based, group oriented; experiential learning; online, blended; etc.);
- when learning takes place (i.e. 24/7, 365 day learning opportunities, varied school day, varied school year);
- where learning takes place (i.e. any physical school – no registration boundaries, virtual school, workplace, community location etc.).

The Organization for Economic Co-operation and Development's (OECD) work on "formative assessment" or "assessment *for* learning" – (Organisation for Economic Cooperation and Development, 2005) suggests a number of broad policy principles. Some of these, like keeping the focus on teaching and learning and aligning summative and formative assessment approaches are embedded in the Ontario Assessment and Evaluation policy. Others, if approached in a planned, strategic and sustainable way, would improve assessment literacy for teachers and students. These recommendations are:

- **Invest in training and support for formative assessment:** Policy can help with guidelines on implementation and by promoting exemplars of good practice.
- **Encourage innovation:** Policy makers and school leaders should promote innovation among confident teachers, and encourage peer support and involvement in research; policy can test research-based innovations through pilot projects.
- **Build good bridges between research, policy and practice:** Develop the research literacy of practitioners and officials, build best-practice databases, and promote new research in identified key areas where gaps exist.
- **Actively involve students and parents in the formative process:** As students are by definition interacting with teachers in the formative process, they need to be involved and encouraged to do so by setting and internalizing their own learning goals and becoming skilled at peer- and self-assessment. This is Assessment for learning in action. The active involvement of parents as in other aspects of school life is always an advantage.



Personal Learning Environments for staff and students also have a role to play in our 21<sup>st</sup> century environment. This would include:

- A focus on training for staff;
- Students must have access to a comfortable place on campus to work independently or in groups; (Frank Kelly, 2008)
- Spaces that enable social interaction, unplanned meetings, and impromptu conversations contribute to personal and professional growth;
- Many different types of communication devices, including laptops, enhanced cell phones, and PEDs, when equipped with wireless access, allow almost any space to become a gathering space that students can use for studying, collaborating and socializing; (Oblinger, 2006)
- Learning must extend beyond the walls of the school, real (i.e. home, community, workplace) and virtually, in a way that makes sense to the student;
- Students are “prosumers” of content, that is both a producer and consumer and technology must collect their learning in a virtual hub;
- Students and staff must have a learning network;
- Learning spaces must be flexible and adaptable and accessible in design and function.

Children develop through interactions, first with the adults in their lives – parents and teachers, then with their peers and ultimately with the environment around them. Environment is the ‘third teacher’.” (The Third Teacher, 2008) Studies on the relationship between pupil performance, achievement and behaviour and the built environment have found that building design can have a positive impact on student achievement. (CABE 2007). This does not suggest that all facilities need to be rebuilt but rather that all schools need to be safe and well maintained environments. Further, within HWDSB, expansion of our elementary renovation standards to include secondary schools would continue to move us in the desired direction.

The Secondary School as a community hub is an inclusive and barrier-free space that provides multiple and inter-related services for **all** members of the community. While it’s most familiar role might be to provide Ontario curriculum to young people, its broader role is to serve all learners of all ages. Students want stronger relationships with their teachers, with each other, and with their communities – locally, provincially, nationally and globally. They want their teachers to know them as people. (Canadian Education Association, 2009). Students also want their teachers to know how they learn. They want their teachers to take into account what they understand and what they misunderstand, and to use this knowledge as a starting place to guide their continued learning. (Canadian Education Association, 2009) Students want their teachers to establish learning environments that build interdependent relationships and that promote and create a strong culture of learning. (Canadian Education Association, 2009)



## The Vision Becomes Clearer

It is human nature to both wonder and worry about the future. Society has devoted books, poems, films and hours of our time imagining tomorrow. In those imaginings, predictions have been made suggesting humans would never leave the Earth, the human voice would never extend beyond the listening ear and Einstein, himself, questioned our ability to split the atom. (Top 30 Failed Technology Predictions, 2007) With the innovations of flight, the telephone and nuclear power, it is reinforcing to note that it is not human nature to be satisfied with the status quo but to seek new and different ways.

Significant change does not happen overnight and must be considered in a planned, purposeful and strategic way. Consider the potential of an environment where...

.... the school operating structure is flexible and meets the needs of all learners:

Such a school might be open 12 months a year. It might operate on a quadmester (4 semesters) system with students beginning at the start of any quad. Students will direct their learning by choosing the semesters that work for them in the year. Students will have access to the school from 7:30 am to 9 pm each day and can choose between various start times that fit their personal or work schedules.

.... the school program recognizes the 21<sup>st</sup> Century Skills that our global economy requires:

Such a school might focus on higher order thinking skills. Skills will be taught through a problem-solving approach. These problems would be authentic and defined by the needs of the community. The solutions to the problems would be evaluated by teaching staff and community partners. Each student would have a community mentor that has some experience in the student's workplace interest. E-learning courses would be available to all students. Staff and students would be collaborating with other educators and students from around the world in an anytime, anywhere structure which supports their tool of choice.

.... the student voice is acknowledged and student needs drive the program:

Such a school might believe that all stakeholders, especially the learners, make a big difference. Mechanisms (focus groups, student senates, surveys, social media spaces, blogs etc.) would be in place to allow all learners to provide input into the school programs and environment. All pathways would be recognized and available to all students. The unique teenage brain would be recognized in overall teaching methods. Each learner would be profiled and programs provided that meet his/her individual learning styles and future goals. Equity would not be an add-on; it would be seen as the foundation for improving student achievement.



....the school is supported appropriately by all members of the community:

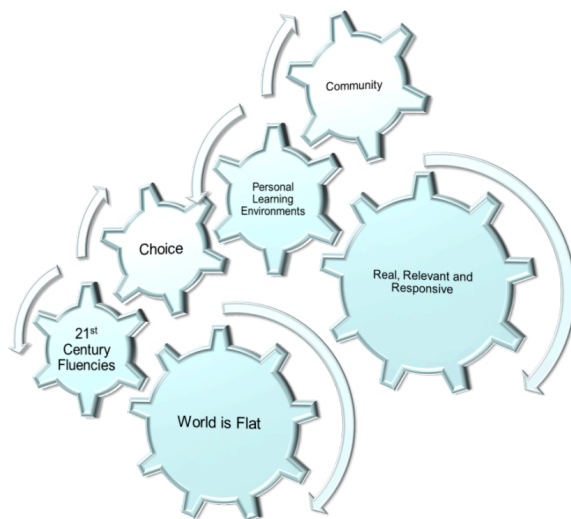
Such a school would function as a community hub. The school would house support services that would benefit its staff and students as well as all members of the community. The students would be supported with an attendance counsellor, a social worker and police liaison officer. The school would house health services and child care services. City staff would operate the library and the gyms during non-instructional times. Parents would be encouraged and supported to volunteer by offering opportunities for work placements, operating homework clubs and supporting other extracurricular programs. The school would be connected (physically or virtually) to other organizations in order to support real-life experiences and problem-solving for students

.... the school facility is well designed and maintained:

The school design that would inspire its users. The classroom structures would be flexible to meet the diverse needs of the learners and the learning activities. The school would have various socialization spaces that support social interaction, unplanned meetings, and impromptu conversations that contribute to personal and professional growth. Aesthetically, the school would be painted with colours that have positive mood associations and would help its occupants feel welcome.

## Building the Ramp – Education for the Future: Guiding Principles

It is evident that the future is uncertain and that our world and our students are changing. As a result, there is a compelling need to respond in a thoughtful and practical way. Within Hamilton-Wentworth District School Board, the adoption of Education for the Future: Guiding Principles is the foundation upon which we are building our ramp to the future.





Education for the 21<sup>st</sup> Century in HWDSB is based upon 6 interdependent principles. Taken together, the *Guiding Principles* define a vision for education.

### **Principle #1: The World Is “Flat”**

The Digital Age has connected our world like never before. This connectivity requires of us a solid foundation in core competencies of Language, Mathematics and Information and Communication Technology ability. However, it is the *skills* of the workforce that will determine the success of core knowledge...” (Rand Report, 2004) Collaboration and competition has moved beyond that of face to face. Forces that “flatten” the world need to be monitored and responded to.

### **Principle #2: 21<sup>st</sup> Century Fluencies**

HWDSB secondary school graduates will have developed 21<sup>st</sup> Century Fluencies (adapted from the 21<sup>st</sup> Century Fluency Project, <http://www.21stcenturyfluency.com/about.cfm>) as outlined below (see page 12) :

- **Solution Fluency**
- **Information Fluency**
- **Creativity Fluency**
- **Media Fluency**
- **Collaboration Fluency**

### **Principle #3: Strategic Choice**

Our 21<sup>st</sup> century learning environments need to be client oriented and allow for strategic choice. All learners have equitable access to programs that meet their needs, abilities, learning styles, interests, aspirations, career paths and reflect student voice in where, when and how learning occurs.

### **Principle #4: Personal Learning Environment**

All learners (students and staff) are entitled to a flexible learning environment that meets their needs, challenges their intellect, encourages local and global collaboration, and provides meaningful feedback on their progress. Schools are designed to support the learner and the delivery of learning. Learning in schools reflects that students think, learn, and socialize through a natural interface with technology.





### **Principle #5: Real, Relevant and Responsive**

Programs, staff and resources are focused on engaging the learner and responding to student voice. Learning is characterized as: learner-centered, self-directed, interactive, skills-based, process driven, integrated, real-life projects, on-demand, collaborative, in a global community, networked, web-based and learning for life.

### **Principle #6: Community**

Secondary school communities are defined by the population within the building, outside of the building – local and global, face to face and virtual. For the student population, learning is social in nature and interaction with all communities is essential. Community has a role within the school. Schools act as “hubs” for the community. Note: A “hub” is defined as a location for community members to access outside of school hours and a location that provides access to support services and community resources

## **Conclusion**

Educators and students need to work together to redefine school and envision what school and school systems could be. We need to explore together. We need to imagine the possibilities! The future is not certain but the need for change is. What we know is that this new definition of school involves co-learning and co-creating. We must embrace what we know about the learners being shaped by the digital age. We must adjust what goes on in classrooms and what a classroom is to meet the needs of these learners. We must teach skills to prepare students for their future worlds even though we can not define what this world might look like. Research and common sense tells us we need learn from our learners.



## Works Cited

- (2009). Retrieved from Pulicolor: [www.publicolor.org](http://www.publicolor.org)
- 21st Century Fluency Series. (n.d.). *Literacy is Not Enough*. Retrieved from 21st Century Fluency Series: <http://www.committedsardine.com/handouts/presentations/LNE.pdf>
- 21st Century Fluency Series. (n.d.). *Understanding the Digital Generation*. Retrieved from 21st Century Fluency Series: [www.21stcenturyfluency.com](http://www.21stcenturyfluency.com)
- CABE. (2007). *Creating Excellent Secondary Schools*.
- Canadian Education Association. (2006). *Imagine a School*.
- Canadian Education Association. (2009). *What Did You Do In School Today?*
- Department for Schools, Children and Families, Great Britain. (2005). *14 - 19 White Paper*. Retrieved from Every Child Matters: <http://www.dcsf.gov.uk/everychildmatters/publications/white-papers/whitepapers/DidYouKnow3.0>
- Did You Know 3.0. (2008). Retrieved from You Tube: [www.youtube.com](http://www.youtube.com)
- Ed Young, H. G.-P. (2003). *Do K-12 School Facilities Affect Education Outcomes?*
- Frank Kelly, T. M. (2008). *Teaching the Digital Generation*. Nelson Education.
- Goldberg, C. N. (2009). *The Future of Learning Institutions in a Digital Age*. MIT.
- Hankivsky, O. (2009). *Cost Estimates of Dropping Out of High School in Canada*. Canadian Council on Learning.
- International Association for the Evaluation of Educational Achievement. (2008). *2006 Second Information Technology in Education Study*.
- KPMG. (2008). *Global Skills Convergence*.
- Martin Prosperity Institute. (2009). *Ontario in the Creative Age*.
- Ministry of Education. (2009). *Learning for All K-12 Draft*.
- OPSBA. (2009). *What If? Technology in the 21st Century Classroom*. Ontario Public School Boards' Association.
- Organisation for Economic Cooperation and Development. (2005). *Formative Assessment: Improving Learning in Secondary Classrooms*.
- Partnership for 21st Century Skills. (2009). Retrieved from Partnership for 21st Century Skills: [www.21stcenturyskills.org](http://www.21stcenturyskills.org)
- People for Education. (2009). *Ontario's Urban and Suburban Schools: A Prescription for Change*.
- Rand Report. (2004). *The 21st Century at Work*.
- Richardson, W. (2009). *Tinkering Towards Utopia*. Retrieved from Weblogg-ed.
- Robinson, K. (Director). (2006). *Schools Kill Creativity* [Motion Picture].
- Tapscott, D. (2008). *Grown Up Digital*.
- The Third Teacher. (2008). Retrieved from The Third Teacher: [www.thethirdteacher.com](http://www.thethirdteacher.com)
- Top 30 Failed Technology Predictions. (2007). Retrieved from Listverse: <http://listverse.com/2007/10/28/top-30-failed-technology-predictions/>
- Ungerleider, D. C. (2008). *Evaluation of the Ontario Ministry of Education's Student Success/Learning to 18 Strategy Final Report*. Canadian Council on Learning.