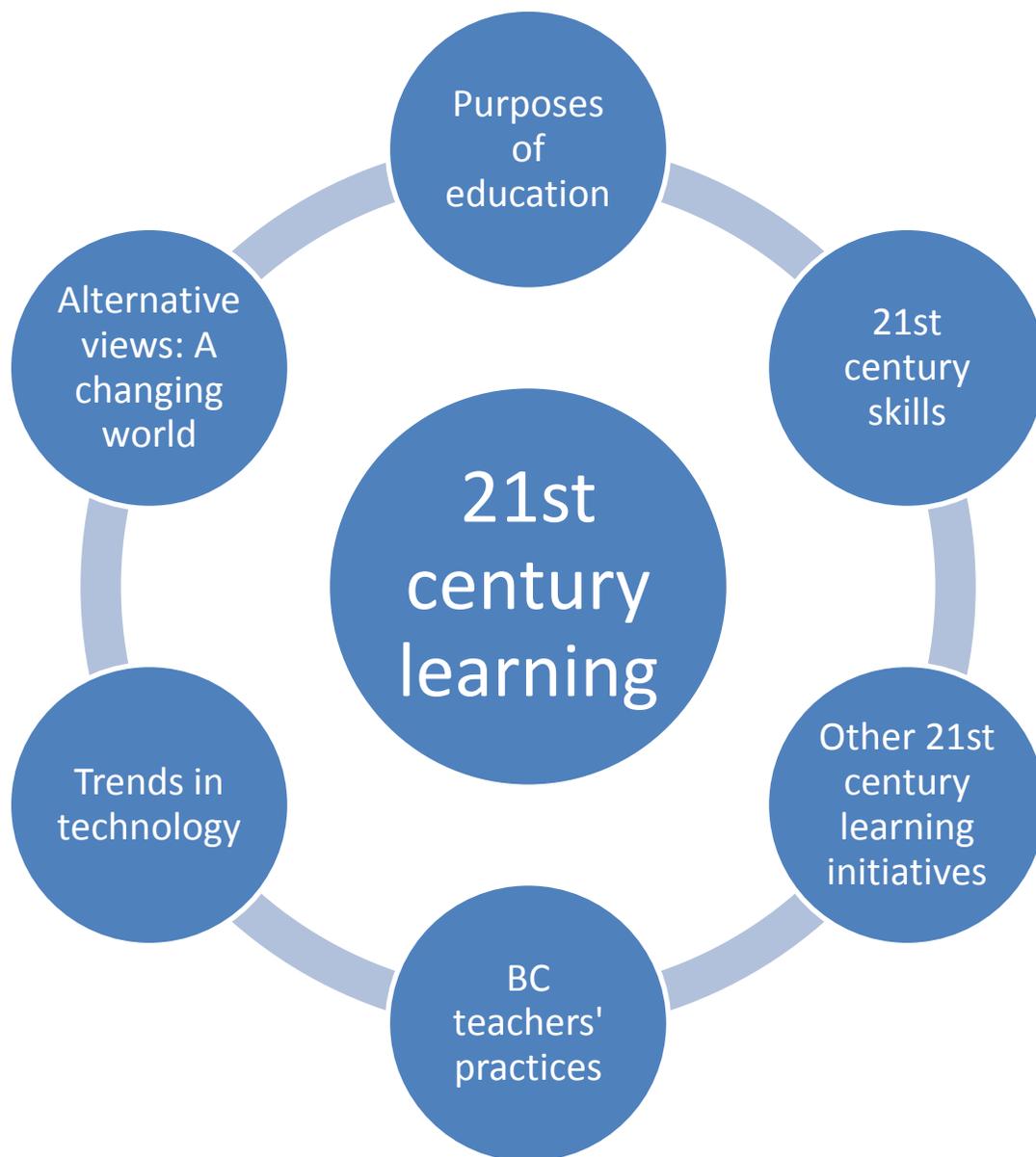


21st century learning— Widening the frame of focus and debate: A BCTF Research discussion paper

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This paper addresses six areas of focus in an effort to discuss 21st century learning, as shown in the graphic below:



An explanation of why, in the light of recent research on the nature of human learning, the present Western, essentially Anglo, system of schooling is both upside down in terms of its distribution of resources, and inside out in terms of its excessive dependence on school-as-place; on formal as opposed to informal learning, and on the teacher as instructor rather than as facilitator. Once the entire system is redesigned on the basis of constructivist and enquiry-based practice, then student dependence on teacher and school will begin to decrease with age. This will allow a growth in student choice and responsibility so escaping from the present dilemma of squeezing out-dated systems to perform in ways which truly release human potential at hitherto unprecedented levels.

“Schools” in the future: What has to change and why.
The 21st century learning initiative (1994)¹

Introduction

Sixteen years after the above document was published, and ten years into the new millennium, the government of British Columbia has launched a series of presentations concerning how learning and schooling might either evolve or be radically changed to incorporate some of the ideas articulated in the above quote. This initiative reflects a welcome change in the sense that the government is sharing its thinking and ideas without launching into directives or policies, allowing for initial discussion and reaction, and for potential consultation and collaboration. However, they are late to the discussion, and well behind many BC public-school teachers, whose twenty-first century learning initiatives have been either thwarted by government policies or consistently ignored by government and ministers.

It is important to recognize that there is much to interest and engage teachers in considering and discussing twenty-first century learning concepts. There are some wonderful ideas that have been expressed, many of which are far from new, and some might be familiar to John Dewey, or even to Confucius, as the authors of the *“Schools” in the Future* noted:

Confucius reminded all those who would listen that ‘tell a child and he will forget; show him and he will remember; but let him do, and he will understand’.

Confucius clearly understood and endorsed a philosophy close to constructivism, as did Dewey. Constructivist approaches are at the heart of much of the discussion of twenty-first century learning. But what evidence there is suggests that neither the Liberal nor the NDP governments of recent times have demonstrated any enthusiasm for constructivist pedagogies. Indeed, governments have instituted funding and system-accountability measures resulting in cuts to teacher numbers beyond those linked to reduced student enrolment, as well as mandating large-scale testing that limits the capacity of teachers to pursue constructivist approaches. These funding and accountability measures tend to reduce constructivist approaches because they increase class size and teacher workload while also increasing pressure on teachers to “teach to the test”, as was found in research conducted by the BC Science Teachers’ Association, who surveyed Science teachers across BC:

¹ <http://www.21learn.org/site/wp-content/uploads/Schools-in-the-Future-April-2010.pdf>

The vast majority of respondents indicated that the Science 10 Provincial Final Exam has caused a significant decrease or entire deletion of lab activities in Science 10 classrooms, coupled with a preponderance of direct instruction through lectures. Additionally, Science 10 students now rarely have the opportunity to do group work, research projects, and classroom presentations, take field trips to Science facilities, or explore local topics or current events, due to the stringency of the approximately 100 Prescribed Learning Outcomes and hundreds of scientific terms that students have to memorize for this exam. Respondents repeatedly stated that the science teachers in their schools no longer wish to teach Science 10.²

So the initial “launch” of a conversation about twenty-first century learning by a government whose actions over time have largely proved antithetical to the concept, has been greeted with some skepticism. When considering educational futures, it is worth stepping back and considering twenty-first century learning from a wider perspective than has been shared in the ministry presentations. One such perspective, ignored by many of those engaged in current debates, concerns the purposes of schooling. Why do we educate?

The purposes of education: Why do we educate, and how do the ideas of 21st-century-learning advocates address this question?³

The much-cited book by John Abbot (*Overschooled but undereducated*, 2010) does address this question. Abbot critiques cultures of materialism and acquisition, and stresses life quality rather than standards of living, arguing that schools are forced into stressing the latter, with curriculum stressing societal values of status, rather than life quality or issues that affect all, such as the environment. Yet, as interesting and valuable as his argument is, Abbot has a limited perspective on an issue pervading educational thinking for centuries—why do we educate? He gets close to what might have been an exploration of this in the fifth of fifteen principles that he articulates as providing a “rationale for a new form of learning” (p. 198). The fifth principle states:

Children’s search for meaning starts young. It is the children who are already anxious to make sense of issues that matter to them in their own private lives, who come to formal schooling anxious to use whatever it can offer them to help meet their personal objectives. Not the other way round. That is why a caring, thoughtful, challenging, stimulating life—a life of childlike proportions—in the greater community is so vitally important. That is why streets that are unsafe for children to play around are as much a condemnation of failed policy as are burned-out teachers. (p. 201)

² <http://www.bcscta.ca//Sci10%20Report.pdf>

³ Some of this section incorporates material originally used in: Naylor, C. (2007). *Collaborative teacher inquiry as professional development: Concepts, contexts and directions*. Ph.D. thesis. UBC.

Abbot is clearly linking the purposes of education to community and society, and to building both a quality of life for the individual while also creating environments which are safe and caring.

UBC Education faculty Stack, Coulter, Grosjean, Mazawi and Smith (2006) address their exploration of the purposes of education by considering “educational ends” and tracing the debate back to Plato and Aristotle. They reference Burbules (2004), who, they suggest, updates the conversation:

Burbules assumes that education is a particular kind of end, one that involves helping people to improve the quality of their lives. In other words, the end of an education is a good and worthwhile life. The fundamental challenge, then, becomes ‘identifying and specifying the specific ideals to which education should aspire; what is it about being educated that makes us better people?’ (Burbules, p. 4; Stack et al, p. 15)

They separate the concept of “ends” from “means”, arguing that much of the debate in education focuses extensively and in some cases exclusively on educational “means”—what is taught and how—rather than “ends”, which reflect wider purposes of education. Yet for many, including Abbot, the “ends” stated by recent governments are also linked to countries’ economies and individual prosperity rather than to any significant focus on developing an individual’s “good and worthwhile life”, which enables citizens’ contributing to a civic and civil society.

Cuban (2003) identified and listed five values that he believes are widely shared and which good schools should develop. These can be considered possible “ends” of an education system, and are included here to illustrate his view of education systems being the foundation of civic participation in a democratic society. By stating these “ends” publicly, Cuban and other authors also encourage discussion of them, and place them firmly within a moral framework, with morality focusing on both the individual and the collective. Cuban’s five values are:

- participation in and willingness to serve in local and national communities
- open-mindedness to different opinions and a willingness to listen to such opinions
- respect for values that differ from one’s own
- treating individuals decently and fairly, regardless of background
- a commitment to reason through problems and struggle toward openly-arrived-at compromise. (pp. 46–47)

In considering how to judge whether a school is “good”, Cuban (2003) posed three questions:

- Are parents, staff, and students satisfied with what occurs in the school?
 - Is the school achieving the explicit goals it set for itself?
 - Are democratic behaviours, values, and attitudes evident in the students?
- (p. 48)

Such criteria may be of low priority in many education systems which currently stress managerial efficiency, and where success is measured in standardized tests which dominate system accountability processes and structures. If such tests dominate educational approaches and drive teaching, then the focus on values must necessarily diminish. Criteria such as those developed by Cuban are highly unlikely to occur in jurisdictions with standards-based centralization and uniformity, yet Cuban offers a clear alternative to standardized accountability linked to narrowly-defined school effectiveness, by stressing “good” over “effective” as the key

concept of schooling, and linking the definition of goodness to a decent individual life and the need for a sustainable and sustaining democracy. Thus, the notion of “goodness” is linked to the moral nature of schooling, while “effectiveness” is linked to managerial efficiency.

Yinger (2005) proposed a vision for the future of teaching which consisted of three components, all including some notions of morality:

- education rechartered as public good, with broad citizen participation in deciding goals and outcomes
- teaching re-framed as a professional covenant, stressing moral purpose and imagination, social responsibility and personal caring
- learning re-cast in its moral, cultural, and human significance, in which healthy communities, good societies, and sustainable ecosystems will be determined as much by moral choices as by scientific knowledge. (pp. 308-309).

Noddings has also articulated a view that the goals of education might be focused on caring and relationship:

She has been able to demonstrate the significance of caring and relationship both as an educational goal, and as a fundamental aspect of education. As a result Nel Noddings’ work has become a key reference point for those wanting to reaffirm the ethical and moral foundations of teaching, schooling, and education more broadly.⁴

Kincheloe (2008) argues for a “fundamental rethinking and deep reconceptualization” of the purposes of schooling to include consideration of:

- what human beings are capable of achieving
- the role of social, cultural, and political in shaping human identity
- the relationship between community and schooling
- the ways that power operates to create purposes for schooling that are not necessarily in the best interests of the children that attend them
- how students and teachers might relate to knowledge
- the ways schooling affects the lives of students from marginalized groups
- the organization of schooling and the relationship between teachers and learners. (p. 6)

The above authors explore the purposes of education in ways that are absent from much of the current discussion of 21st century learning. Their focus is on the needs of the individual and the needs of society, which they view as fundamentally linked to a quality of life which is primarily moral and ethical. Yet this is not a narrow view of imposed morality or ethics, but one based on building a “good” life in an inclusive, sustainable, just, and caring society. The views expressed by the advocates of 21st century learning, and those of what I will term the “civil society”, are quite different, but not necessarily dichotomous. They are different because one (21st century learning) focuses primarily on “means” while the other (civil society) group largely addresses “ends”. The first suggests radical change of teaching and learning approaches to fit within new economies and new technologies, while the latter suggests we consider what kind of world we want and then build approaches within education systems to create such a world.

⁴ <http://www.infed.org/thinkers/noddings.htm>

Another difference is the “de-schooling” aspect explicit or implicit within the 21st century learning literature. While the “civil society” advocates see public schools as central to maintaining democratic societies, the 21st century schooling advocates lessen the primacy of school both as the place for the delivery of educational services and conceptually as central to the socialization of youth into civil and civic norms. The paper entitled “*Schools*” in the future uses quotation marks to make it clear that they do not necessarily see schools as central to learning, and many of the UK’s Innovation Unit’s publications suggest strategies and approaches that effectively lead to de-schooling, while at the same time such de-schooling is not always explicit. So when increased use of community resources, more extensive “personalized” learning, and technology-based methods are stressed, some of these approaches imply or directly delineate de-schooling. Other favoured approaches include formal or informal privatization, with the promotion of Swedish independent schools⁵, San Diego Charter schools⁶, and the Harris Federation of Schools⁷ in South London, UK. The common denominator among these schools in terms of governance and administration (but not funding) is that they all exist outside of state or school-district control. In the various presentations of the Innovation Unit, state systems are equated with bureaucracy, while these are shown as having the freedom to innovate and to change.

The issue of de-schooling requires more attention than this paper can provide. It would be interesting to go back to who many consider the original “de-schooler”, Ivan Illich, and consider how his and the less overt but more current de-schooling concepts fit or diverge. Illich (1971) stated:

Universal education through schooling is not feasible. It would be no more feasible if it were attempted by means of alternative institutions built on the style of present schools. Neither new attitudes of teachers toward their pupils nor the proliferation of educational hardware or software (in classroom or bedroom), nor finally the attempt to expand the pedagogue’s responsibility until it engulfs his pupils’ lifetimes will deliver universal education. The current search for new educational funnels must be reversed into the search for their institutional inverse: educational webs which heighten the opportunity for each one to transform each moment of his living into one of learning, sharing, and caring. We hope to contribute concepts needed by those who conduct such counterfoil research on education—and also to those who seek alternatives to other established service industries. (p. vii)

One issue not addressed by the proponents of these examples is scaling-up—the shift from a change or innovation in one or a small number of sites to system-wide implementation. Examples of small-scale educational innovation are relatively easy to find, and are often successful because they attract students, teachers, and families who support the innovation and want to make it work. While many descriptors of innovation assume emulation is simple, scaling up an innovation is often far more difficult than sometimes acknowledged (Blumenfeld et al, 2000). Of course, system-wide change can be mandated, but as Fullan (2009) noted:

Creating change in education is easy. Many governments have done it by changing funding or policies or information or governance structures. However, these

⁵ <http://www.kunskapsskolan.se/foretaget/inenglish.4.1d32e45f86b8ae04c7ff213.html>

⁶ <http://www.cde.ca.gov/ds/si/cs/ap1/countyresults.aspx?id=37>

⁷ <http://www.harrisfederation.org.uk/>

changes are not necessarily improvements. There are plenty of examples of large-scale change efforts that have not produced the required results. (p. 190)

The provision of public education has a history, and an awareness of this history is crucial to understanding the current debate on 21st century learning. Both John Abbot's (2010) review of schooling history in England, and the work of MacDonald and Hursh (2006) have identified the creation and evolution of schooling, at different points in history, to meet the needs of the church, merchant classes, and industrial societies. Just how those needs were to be met was often defined by a ruling and controlling class which in many instances stratified education systems so that some citizens received no or minimal schooling while others were privileged either in resource and/or pedagogical terms. Anyon (1981, 2005) argued that such stratification continued into the late twentieth century and persists today:

Recent scholarship in political economy and sociology of knowledge has also argued, however, that in advanced industrial societies such as Canada and the US, where the class structures are relatively fluid, students of different social class backgrounds are still likely to be exposed to qualitatively different types of educational knowledge. (1981, p. 3)

Cathcart and Esland (1991) argued that the state designed education systems in order to produce what they termed "compliant-creative workers", with school-leavers tame enough to follow orders but smart enough to do the work and make any minor adaptations of practice to maximize effectiveness and profits. Livingstone (2004) also argued that:

The dominant ideologies of learning that emerged with hierarchically-organized class societies appear to have stressed the intricacy or mystical nature of ruling specialist knowledge while subordinate group ideologies emphasized the benefits of their 'really useful' practical knowledge. Industrial capitalism rent the veil of secrecy of medieval craft guilds and promised democratic access to literacy and advanced working knowledge through mass schooling. This dominant ideology has now grown into calls of lifelong learning for all. But selection for higher levels of public schooling has always discriminated against lower classes and various ethnic minorities, while the numbers of more highly-credentialled specialists who continue to claim exclusive knowledge has continued to increase. (p. 5)

Schooling has mirrored various ruling class priorities and needs to stratify, socialize, and control populations. The history of schooling tells us that schools serve ideologies, and have been developed to create the kinds of societies decreed necessary by those in control, first the church, then merchant and later industrial capitalist classes. One might reasonably ask whether current proposals for innovation simply reflect a newly-emerging dominant class of knowledge-economy multi-national corporations and high-tech companies, where de-schooling reflects outsourcing, and where privatization and technology-based learning offer rich rewards for the likes of Microsoft, Cisco, Apple, and others. It is also possible to argue that the lack of explicit "ends" in the current debate masks the implicit purposes inherent in the assumptions of a narrow view of a high-technology world and knowledge economies. If the world is as simple and as narrowly-defined as this, then the focus on democratic societies, social justice, and sustainability is clearly unnecessary for some proponents of 21st century learning.

Posing such a question does not alter the fact that the world is changing in ways that require change in education, and that technology can and should be used to support learning. Nor does it

counter the challenge to public school systems provided by models of schooling which often incorporate sound learning principles and exciting innovations. While public school systems need to adapt, the labeling of all public schooling as inefficient, bureaucratic, and lacking in innovation should be challenged. A later section of this paper addresses this in part by sharing a few examples of innovative practices by BC public-school teachers.

What other factors might we review when considering some approaches to learning in the future?

It is important to recognize that recent BC ministry of education presentations, and information presented at the BC School Superintendent's Association (BCSSA) conference, do not cast a comprehensive view of twenty-first century learning options, but are selective. So where to go in the mass of information in order to gain a reasonable sense of what, as Mulder and Scully might say, "is out there"?

1. Trends in technology

There are myriad analyses of technological trends. Rather than review a range of trends, one wide-ranging analysis is shared here. The New Media Consortium report, the *2010 Horizon Report: K–12 Edition*⁸:

introduces six emerging technologies or practices that are likely to enter mainstream use in the educational community within three adoption horizons over the next one to five years. Each report also presents critical trends and challenges that will affect teaching and learning over the same time frame.

While this report may also generate antipathy among those who are critical of recent 21st century learning discussions, it identifies a number of key areas worth considering. The 2010 report outlines five key trends which will have significant impact on education systems between 2010 and 2015:

- Technology is increasingly a means for empowering students, a method for communication and socializing, and a ubiquitous, transparent part of their lives.
- Technology continues to profoundly affect the way we work, collaborate, communicate, and succeed.
- The perceived value of innovation and creativity is increasing.
- There is increasing interest in just-in-time, alternate, or non-formal avenues of education, such as online learning, mentoring, and independent study.
- The way we think of learning environments is changing.

⁸ <http://www.nmc.org/pdf/2010-Horizon-Report-K12.pdf>

They also identify five critical challenges facing schools in the same period:

- Digital media literacy continues its rise in importance as a key skill in every discipline and profession.
- Students are different, but educational practice and the materials that support it are changing only slowly.
- Many policy-makers and educators believe that deep reform is needed, but at the same time, there is little agreement as to what a new model of education might look like.
- A key challenge is the fundamental structure of the K–12 education establishment.
- Many activities related to learning and education take place outside the walls of the classroom—but these experiences are often undervalued or unacknowledged.

Some of these statements require further consideration. That “students are different” appears ambiguous—are the authors referring to individual differences or differences between students of today and earlier times? The former is being addressed by many educators with differentiated instructional approaches, but these approaches lack systemic support from government, at least in BC. The last statement—that activities outside of classrooms are undervalued and unacknowledged—appears general and unsubstantiated, and might be challenged by many teachers who incorporate students’ out-of-school experiences into their pedagogy. While most of these statements reflect areas worthy of investigation and debate, they might be better posed as questions rather than as definitive statements.

Having provided their view of trends and challenges, they provide three sets of timeframes within the next five years and outline what they believe will be the six technologies which, in the next five years, will significantly impact K–12 education:

Within 12 months:

- **Cloud computing**⁹ has transformed the way we think about computing and communication, data storage and access, and collaborative work.
- **Collaborative environments** can be complete, off-the-shelf packages, or collections of do-it-yourself tools, depending on the level of comfort of the teachers and support personnel and the needs of the students using the systems.

In 2–3 years:

- **Game-based learning** has grown in recent years as research continues to demonstrate its effectiveness for learning.
- **Mobiles** is no longer about the devices themselves, but about the blurring of the boundary between the cellular networks and the Internet. Increasingly, and more so in the developing world.

⁹ http://en.wikipedia.org/wiki/Cloud_computing

In 4–5 years:

- **Augmented reality (AR)** has become something anyone can use, thanks to the convergence of three technologies—GPS, video, and pattern recognition—and the applications seem endless.
- **Flexible displays** are seen as an important enabling technology in development, and those that exist today hint at what will be possible in coming years.

2. 21st century skills

There exists an ever-expanding literature which articulates 21st-century skills, some of which is influenced by high-tech companies. Much of it is less new than its advocates are claiming. Critical thinking, problem-solving, and inter-personal skills may have new labels, but are old perennials. A typical example of listing such skills is stated by Trilling and Fardel (2009):

- **Learning and Innovation skills:** Creativity and Innovation, Critical Thinking and Problem Solving, and Communication and Collaboration
- **Digital Literacy skills:** Information Literacy, Media Literacy, and ICT Literacy
- **Career and Life skills:** Flexibility and Adaptability, Initiative and Self-Direction, Social and Cross-Cultural Skills, Productivity and Accountability, Leadership and Responsibility.

The *Learning for the 21st century* report¹⁰ (2003) offers the following as 21st-century-learning skills:

Information and communications skills

Examples: Using communication, information processing, and research tools (such as word processing, e-mail, groupware, presentation software, and the Internet) to access, manage, integrate, evaluate, create, and communicate information. These skills include information and media literacy skills.

Thinking and problem-solving skills

Examples: Using problem-solving tools (such as spreadsheets, decision support, and design tools) to manage complexity, solve problems, and think critically, creatively, and systematically.

Interpersonal and self-directional skills

Examples: Using personal development and productivity tools (such as e-learning, time managers, and collaboration tools) to enhance productivity and personal development. These skills include accountability and adaptability skills.

Such skills look towards a brave new world of new economies and new work, or envision dire consequences if education systems fail to move towards such worlds. They focus almost exclusively on educational means and have little time for any discussion of ends, unless the ends are either linked to human capital (which in Wikipedia “refers to the stock of competences, knowledge and personality attributes embodied in the ability to perform labour so as to produce economic value”), or are perhaps assumed and implicit. The focus is primarily economic, and

¹⁰ http://www.p21.org/downloads/P21_Report.pdf

skills are identified and promoted so that the interests of the individual, corporations, and the state are assumed to be common.

Such assumptions, however, have been challenged on many fronts. David Korten (2010)¹¹ claims that the term “New Economy” originated with the May 30, 1983 edition of *Time* magazine. He critiques much of the new economy articulation as a “high-tech fantasy”. Korten also references the (UK) “New Economics Foundation” report *The Great Transition*¹², which does articulate a new economy, but one in which economic growth and multi-national corporate interests are not the prime driver:

There is an important place in the New Economy 2.0 vision for advanced technologies and for global sharing of ideas and technology. This is particularly true for energy and communications technologies that wean us from dependence on fossil fuels and support and collective decision making on a global scale. New Economy 2.0 does not, however, assume that technology will magically save us from our reckless abuse of one another and nature. Rather technology is a facilitator of the deep transformation of values and institutions required to achieve an economic system that meets the needs of all in sustainable, creative balance with Earth’s biosphere.¹³

In BC, the Premier’s Technology Council released its “Vision for 21st Century Education”¹⁴ in December, 2010. It’s curious that a technology group feels confident that it can define a vision of education for a new century, and while it certainly boasts impressive technology-related expertise, its efforts at articulating a vision of ethics, civic responsibility, and cross-cultural awareness might have been better left alone. The Technology Council report states:

Students must also understand they are part of a complex society and that they have a responsibility to that society. Although not everyone shares precisely the same views on all topics, there remain many things that society does agree on. It is important that students in our K–12 system learn what these are. There are common ethics about the way we treat others, the way we treat our environment, and about obeying the law. We share a civic responsibility and students must come to understand the importance of civilized discourse on issues and their role in a democratic society. (p. 12)

This quote perhaps ideally illustrates why decisions about the future of education cannot be handed over to corporate executives of high-tech companies and business-school deans. Their sparsity of thinking is significant. They simplistically suggest that society is complex but there remain many things we all agree on, so students should be informed of these areas of consensus. Consider some examples: perhaps the environment and climate change? What about Iraq/Afghanistan? Or even if we narrow the field to some federal government areas of focus, how do we all view the census? The role of science and/or evidence in making decisions? The gun registry? All of these complex areas reveal deep differences, and show that very little actually is agreed on in society, and that little is served by teaching complacent platitudes about the norms of civic society which can be challenged by considering almost any issue.

¹¹ http://www.davidkorten.org/competing_visions

¹² http://www.neweconomics.org/sites/neweconomics.org/files/Great_Transition_0.pdf

¹³ http://www.davidkorten.org/competing_visions

¹⁴ http://www.gov.bc.ca/premier/attachments/PTC_vision%20for_education.pdf

What is more startling than the Council's woeful attempt to address ethics, civil responsibility, and culture is their minimalist approach to issues vital to maintaining civil society. With just one paragraph addressing these issues, and a few token mentions of social inclusion and culture (some of which are only good because they promote business), the report has as big a focus on digital citizenship (found in Appendix A of the report) as it does on citizenship as a wider concept.

However, its authors do a much better job when it comes to what they know better: technology. They offer some useful areas for discussion, from the needs of a knowledge-based society to its views on shifting roles and on assessment of student learning. It is also pleasing to see the Council and the province's premier apparently endorse the BCTF's position on assessment and testing:

From Testing to Assess to Assessing to Learn: Technology allows educators and students to assess progress more regularly than with traditional classroom assessments and to identify and address each student's challenges as they arise. This is in contrast to tests and exams that measure what a student learned at the end of an instructional unit, by which time it is often too late to address shortcomings. (p. 2)

This reflects a curious dichotomy in the current discussion, in which the premier of a provincial government criticizes his own policies while promoting a stance very similar to that articulated by the BCTF, which in turn was rejected by the government as it promoted the merits of Foundation Skills Assessments, as well as Grade 10 and 12 exams.

The Council's priorities for 21st century learning to meet the needs of a knowledge-based society are stated as:

- **Functional Numeracy and Literacy:** Numeracy and literacy are foundational to any meaningful participation in a knowledge-based society. Numeracy is the ability to understand how to apply mathematical concepts to problem solving and to everyday life. Individuals must be functionally literate, in other words they must be able to learn from what they read.
- **Critical Thinking and Problem Solving:** Students need the search skills required to access information, the critical thinking skills to analyze and evaluate that information, and the problem solving skills required to effectively use that information. It involves purposeful, reflective judgment, logical analysis, and assessment of factual accuracy, credibility, significance and fairness.
- **Creativity and Innovation:** Creativity and innovation allow one to generate ideas and concepts, to see information in a different way from others, and to approach issues from a different direction.
- **Technological Literacy:** Technology literacy is the ability to use technology to amplify one's learning ability, and improve one's productivity. It means the ability to use technology rather than the ability to construct or maintain technology.
- **Communications and Media Literacy:** Communication is the ability to relate concepts and ideas to others either in person, on the page, or through technology. Media literacy includes the ability to interpret and use media to

access, assess, and analyze information, and the ability to use new media forms to communicate information.

- **Collaboration and Teamwork:** The interactive nature of a knowledge-based society mandates the ability to collaborate. Innovation requires multiple people interacting in different ways and this increasingly takes place through interactive technologies.
- **Personal Organization:** Personal organization includes organization of possessions and educational materials as well as time management, such as keeping track of assignments, due dates, and deadlines.
- **Motivation, Self-Regulation, and Adaptability:** Motivation through self-regulation is the ability to set and accomplish one's own objectives. Knowing how and when to put in effort, how to make responsible personal decisions, and how to prioritize choices and actions enables independence and the transfer of skills to a variety of occupations.
- **Ethics, Civic Responsibility, Cross-Cultural Awareness:** Common ethics about the way we treat others, the way we treat our environment, about civic duty to society and about obeying the law are important to properly function in society. Cross-cultural awareness will also be important because of BC's multiculturalism and because of our increasingly connected global society. (pp. 1–2)

One is left with the sense that this and many other bodies looking at 21st century learning skills have either fully bought into the “high tech, high pay” version of the new economy vision, or are the executives of high tech companies which stand most to gain from the increased use of technology in schools and society. While they argue for the needs of a knowledge-based society they rarely remove the “knowledge-based” and simply address the needs of society. Their focus on civil society, on culture, the environment, race, gender, disability, and equity is minimal or non-existent. However, the 21st century learning initiative web site¹⁵ does state that one of the goals of the 21st century learning initiative is the “building of sustainable community as a support for human endeavour.” This focus on sustainability is not, however, continued or consistent in many areas of 21st century learning advocates' focus, although the learning initiative web site also states that “plans are being made to establish an initiative for the study of human learning, values, ethics, and community development”. Such plans may address and possibly remedy the limited focus on equity and environment to date by incorporating issues of social justice and sustainability to widen the frame of what constitutes 21st century learning.

In many ways, though the vocabulary is new, some advocates of 21st century learning sound remarkably like those nineteenth-century thinkers who argued that what society (i.e., factory owners) needed was a steady supply of stratified workers suited to their station in life and who contributed to the success of the industrial economy as discussed by Macdonald and Hursh (2006):

Those who employ people in factories quite reasonably prefer order to disorder. The industrial order prefers tidiness to creativity. The bell-punctuated routines of school days, and the disciplines of figuring, copybook, and text—all of these commended themselves to the new industrial class. Schools for the poor ceased to

¹⁵ <http://www.21learn.org/site/archive/about-the-initiative/>

be an expensive beneficence. They became a functional and accepted part of the late Georgian and Victorian social and industrial regime. (p. 24)

It could be argued that the acquisition of those 21st century education skills shown above is designed to provide an equally steady supply of workers with good technology and adaptive skills to maximize profits, while there exists considerable evidence that the companies who employ them prefer to pay minimal tax or, should that not happen, move their locus of production elsewhere. What skills, then, meet the needs of which segments of society, and what kind of society is being created?

3. How the world is changing—Some alternative perspectives on economic and societal trends

Consider the recent analysis of a social and economic polarization in Toronto:

Toronto is becoming a city of stark economic extremes as its middle class is hollowed out and replaced by a bipolar city of the rich and poor—one whose lines are drawn neighbourhood by neighbourhood.

New numbers indicate a 35-year trend toward economic polarization is growing more pronounced: The country's economic engine, which has long claimed to be one of the most diverse cities in the world, is increasingly comprised of downtown-centred high-income residents—most living near subway lines—and a concentration of low-income families in less dense, service- and transit-starved inner suburbs. (*Globe and Mail*, December 15, 2010¹⁶)

The widening gap between high- and low-income earners, with the projected diminution of the middle class, was also the focus of a recent CBS (2010) news item:

Pay for future service-sector jobs will tend to vary from very high to very low. At the same time, the number of middle-income service-sector jobs will shrink, according to government projections. Any job that can be automated or outsourced overseas is likely to continue to decline. The service sector's growth could also magnify the nation's income inequality, with more people either affluent or financially squeezed.

Anyon (2005) shared a (US) view of trends in urban settings:

While states are defined by geographic and political boundaries, metropolitan areas are shaped by regional markets—for jobs, housing, investment, and production. Metro areas account for over 80% of national output, and drive the economic performance of the nation as a whole. Each metro area is anchored by one or two cities.

Today, metropolitan regions are characterized by population growth, extensive inequality, and segregation. The percentage of racial minorities in large metropolitan areas who live in the suburbs jumped from 19% to 27% during the 1990s. However, a growing share of these families lives in fiscally stressed

¹⁶ <http://www.theglobeandmail.com/news/national/toronto/shrinking-middle-class-makes-toronto-a-city-of-socioeconomic-extremes/article1838176/page1/>

suburbs which contain an increasing number of neighbourhoods of concentrated poverty. (p. 8)

Livingstone (2004) has argued that the concept of the “knowledge economy” has been considerably overstated and oversold, providing evidence that there are far more jobs that have been or will be created that do or will require relatively low skill levels:

The most recent thorough empirical assessments of skill changes in the US—which was the original source of claims about the shift to a knowledge-based economy—have also found little evidence for more than a gradual increase in job skill requirements either in the entire post-WWII period or in very recent trends (Barton, 2000; Handel, 2000). US Bureau of Labor Statistics’ estimates project that only about 20 percent of job openings will require a university degree in the early part of this century, compared with over a third of new entrants who have one, while the vast majority of new jobs will require only short-term training (Hecker, 2001). The weight of empirical evidence clearly indicates substantially less skill upgrading of jobs than the heralds of the knowledge-based economy typically assume. Future discussions of increasing demand for more highly skilled knowledge workers should pay at least as much attention to the slower growing forest of routine data transmitting, service providing, and goods processing jobs as to the faster growing knowledge work trees. (p. 10)

Livingstone also suggests that Canada, like many countries, is witnessing “credential inflation”, where employers consistently overstate the required credentials needed to do a job simply as a sorting mechanism for hiring. Thus, Livingstone argues, there are many people now working with much higher educational credentials than are necessary for the work involved. Livingstone’s proposed solutions include work redistribution (reducing the hours of those working over 50 per week, and increasing them for those working under 30) and workplace democratization (including work teams, job rotation, job enrichment, incentive pay, flexible scheduling, etc.) to reduce polarization and create greater equity in the workplace.

Livingstone’s argument is that while the case for a knowledge economy has been greatly overstated, imbalance and inequities are occurring in workplaces, so that addressing over/under working and other inequities will benefit individuals and society. The issue of greater work and societal equity, missing from much of the twenty-first century learning literature, has a base not only in a range of literature but also in societies such as Finland, often touted as a world leader in twenty-first century learning:

The Finnish Ministry of Education and Culture insists school performance is linked to a close attention to social equity issues. The Finnish childhood poverty rate is one of the lowest in the industrialized world. Universal health and dental care, paid parental leave, and seamless social services are a given. (Ravani, 2010)

Wilkinson and Pickett (2010) also make a case for greater equality in society, arguing that benefits to both health and education accrue:

We show no fewer than five sets of data...illustrating that, whether you classify people by education, social class or income, people in each category are healthier (or have higher literacy scores) if they are in a more equal society than people in the same category of income, education or class in a less equal society. (p. 275)

The governance of society also appears to be absent from much 21st century literature. It seems from reading some of this literature that if societies attend to the brave new world of high-technology, then some form of economic nirvana will accrue within a globalized world where governance within the individual nation state becomes irrelevant. While this may be a contested extrapolation from the literature, the extent of globalization has effectively reduced nations' capacity to regulate, tax, and govern, as manufacturing and outsourcing of some service industries moves to the cheapest area of production. Morrisette and Johnson (2005) stated:

Recently, a new version of the deindustrialization hypothesis has emerged. Some observers are suggesting that employers now use outsourcing abroad not only for manufacturing, but also for jobs in the service sector that have high-skill requirements (*BusinessWeek*, 2003, 2004). The rise of information and communication technologies combined with the availability of relatively skilled workers in fast-growing countries would now allow firms to contract out 'intelligent' jobs in sectors such as engineering and informatics. (p. 1)

Yet with the recent economic meltdown, corporate greed and inadequate governance and regulation were clearly exposed. Ransom (2009) argues for the retention of the nation state as one aspect of defence against corporate globalization:

Corporate globalization was said to presage the demise of the nation state. Yet the nation state remains just about the only institution with effective tax-raising or regulatory powers, for the simple reason that it comes closest—if not necessarily that close—to people's sense of democratic legitimacy. Nation states, paradoxically now so critical to the 'recovery' of corporate globalization, cannot be left as mere tools of extortion, withering the roots of democracy in workplaces, villages, neighborhoods and municipalities. (p. 16)

The above quotes offer the context or backdrop against which the discussion of 21st century learning is occurring, yet rarely is that discussion located in this context. The rich and varied literature offers alternative analyses of the governance, economies, social needs, and possibilities in a world which can be created for maximum human benefit, and this literature should be present in any discussion of school reform. The critiques and proposals in this literature suggest that people need not be merely fitted into work and lives which meet the needs of corporations but that the world can be shaped, or re-shaped, to develop and maintain sustainable and equitable lifestyles for its inhabitants.

The above examples briefly consider economic inequities and governance. But perhaps even more important are environmental issues, at a time when the fate of the earth is the focus of much analysis and discussion. Consider the following statements:

- Everyone in the world depends on nature and ecosystem services to provide the conditions for a decent, healthy, and secure life.
- Humans have made unprecedented changes to ecosystems in recent decades to meet growing demands for food, fresh water, fiber, and energy.
- These changes have helped to improve the lives of billions, but at the same time they weakened nature's ability to deliver other key services such as purification of air and water, protection from disasters, and the provision of medicines.
- Among the outstanding problems identified by this assessment are the dire state of many of the world's fish stocks; the intense vulnerability of the two

- billion people living in dry regions to the loss of ecosystem services, including water supply; and the growing threat to ecosystems from climate change and nutrient pollution.
- Human activities have taken the planet to the edge of a massive wave of species extinctions, further threatening our own well-being.
 - The loss of services derived from ecosystems is a significant barrier to the achievement of the Millennium Development Goals to reduce poverty, hunger, and disease.
 - The pressures on ecosystems will increase globally in coming decades unless human attitudes and actions change.
 - Measures to conserve natural resources are more likely to succeed if local communities are given ownership of them, share the benefits, and are involved in decisions.
 - Even today's technology and knowledge can reduce considerably the human impact on ecosystems. They are unlikely to be deployed fully, however, until ecosystem services cease to be perceived as free and limitless, and their full value is taken into account.
 - Better protection of natural assets will require co-ordinated efforts across all sections of governments, businesses, and international institutions. The productivity of ecosystems depends on policy choices on investment, trade, subsidy, taxation, and regulation, among others.

(Millenium Ecosystem Assessment: Natural Assets and Human Well-Being, 2005)

These statements from a body co-chaired by representatives from the World Bank and the United Nations, hardly radicals, focus attention on the need to consider extensive changes in the world's policies to keep the world alive. Surely, then, twenty-first century learning must include a significant consideration of the environment: how to teach and to learn about managing and ensuring a sustainable world? It might also address potential limits to economic growth in the context of declining resources and global climate change. Yet there appears minimal and often tokenistic acknowledgment of the importance of environmental issues in much of the 21st century learning initiatives to date.

4. Other 21st century learning initiatives and literature¹⁷

Another weakness in the ministry's recently-shared presentations and information is its lack of recognition of a range of both initiatives and literature which have addressed issues of twenty-first century learning.

Macdonald and Hursh (2006) start their book with the following statement:

Training is a preparation for a future we know
Education prepares for a future we don't know.

¹⁷ Some of this section incorporates material originally used in: Naylor, C. (2005): *Understanding the concept and evolution of the Multiliteracies literature since 1996, with a consideration of its relevance to a Canadian teacher union engaged in a Multiliteracies collaborative research project.*

The authors argue for new forms of schooling for the new century, where economies and social structures appear less predictable than in some previous eras. It's not a new argument, but what's different about this book is its analysis of UK and US initiatives, and in particular its critique of what the authors term "myth-making". What they argue to be myths include a belief that schools can be improved while classes have one teacher and "thirty or so" students. The book challenges England's centralized and standardized mandates such as "literacy hour", which take precedence over any teacher with innovative but different approaches to improving literacy. They also offer strong critiques of New York and Chicago initiatives that they believe make it less likely that students in public schools in both jurisdictions would access the kind of education that they are advocating.

In terms of what they propose rather than critique, Macdonald and Hursh include a number of preferences. Three are considered briefly here: the expanded use of simulation, digital gaming, and professional networking. Simulation, they suggest, can be used to engage learners in increasingly-complex environments and processes. Simulation accesses technology to make experiences accessible to students in ways not previously possible. In terms of digital gaming, the authors argue that many teachers shun digital games but they believe such games open "immense possibilities" for education. In terms of professional networking, they argue that increased networking can reduce teacher isolation within and across schools, increasing both collaboration and collegiality.

Macdonald and Hursh appear optimistic in their statement that:

There are not many fortunate junctures in the history of schooling, but this may be one of them. Perhaps for the first time in history, the needs of national economies are converging with the needs of learners. We are moving towards a new type of economic structure which will make new demands of our school system, and open new doors for pupils. (p. 195)

There appears little evidence actually offered by the authors to build a case that such convergence is likely, yet the statement articulates a large part of the essential challenge of twenty-first century learning: how to meet both the economic needs of society and the needs of learners. With one extension of Macdonald and Hursh's work—the social needs of diverse and predominantly urban societies—one might well have a frame for 21st century learning which meets learners' needs and addresses economic development while also building a civil, just, and inclusive society.

However, the most startling omission from recent discussions and presentations is the Multiliteracies literature about the future of education in a rapidly-changing world, which originated with the New London Group. This literature does offer the possibility of convergence between state and individual needs within diverse and multicultural societies that Macdonald and Hursh consider.

The New London Group consisted of ten academics from the USA, Australia, and the UK, publishing their paper following a two-year period of communication originating in New London, New Hampshire. With five of the group working in Australia, three in the USA, and two in the UK, the New London Group reflected an eclectic mix of academic brilliance and both extensive and substantive experience in language and literacy education. They outlined their

theories in the *Harvard Educational Review* of Spring 1996¹⁸, and, at the same time, invited “educators with similar or complementary interests” to connect and communicate with them. This approach essentially declared a new pedagogy, and its proponents invited the world to think about it. Their paper reflected the initiation of the term Multiliteracies and of considerable debate and publishing that shows little sign of abating.

The New London Group’s initial definition breaks down the concept into three contexts. The first explores the multiplicity of communication channels in today’s technological society, with diverse modes of representation and expression such as visual and spatial expressions in multi-media forms, often transmitted through mass media:

Two main arguments, then, emerged in our discussions. The first relates to the increasing multiplicity and integration of significant modes of meaning-making, where the textual is also related to the visual, the audio, the spatial, the behavioral, and so on. This is particularly important in the mass media, multimedia, and in an electronic hypermedia. We may have cause to be skeptical about the sci-fi visions of information superhighways and an impending future where we are all virtual shoppers. Nevertheless, new communications media are reshaping the way we use language. When technologies of meaning are changing so rapidly, there cannot be one set of standards or skills that constitute the ends of literacy learning, however taught. (p. 65)

The second context focuses on the changing nature of the state and the nature of economies within such states. They outline the decline of welfare states and the growth of economic rationalism, privatization, de-regulation, and the growing prevalence of “market economy” thinking applied to schools and education systems. The world of work is described as changing from the mass-production of “old capitalism” (12 references, including Senge, 1991) to post-Fordist (Piore and Sabel, 1984), and fast capitalism (Gee, 1994). The post-Fordist world of work, it is claimed, has flattened hierarchies with new workplace cultures emerging where employees identify with an organization’s vision, mission, and corporate values, and work together in project teams to meet niche, not mass, markets, with mentoring and training within learning organizations. Almost all of this discussion of work context is based on an existing literature, but one that has rarely been synthesized as effectively before the New London Group’s effort. They offer a convincing argument, with evidence, of the economic contexts in which new languages or discourses occur, which they believe makes necessary their proposed pedagogy of Multiliteracies.

The third context is social and cultural, focusing on issues of local diversity in a world of global connectedness. Local diversities include multicultural urban environments, with a range of languages, accents, and dialects. The perspective of the authors is that such contexts contain considerable social, cultural, and economic assets that should be viewed positively, rather than as deficits. They stress terms such as “democratic pluralism” and “productive diversity”, not only as terms of respect but also as ideals and as necessities for the promotion of both social equity and economic development. Using this as a foundation, they argue that teachers and others can build on the individual cultural assets of students and community. But such assets can also be economically useful, with, as an example, multilingualism being useful for the export sale of goods or services to societies using the same languages.

18 New London Group. (1996). “A pedagogy of Multiliteracies: Designing social futures.” *Harvard Educational Review*, 66,1, pp. 60–91.

The authors explore and stress the notion of equity within social and cultural contexts. They argue that considerable disparities of educational outcomes exist, and that such disparities are often correlated to cultural and socio-economic groupings. They state their view that the mission of education is to ensure that all students benefit from learning so that they can participate in civil society and in the economy. Given this belief, and their stated mission for education systems that meet all students' needs, they argue that the new pedagogy of Multiliteracies is also an attempt to build equity of outcomes in schools, and to challenge the old economic and social orthodoxies inherent in old capitalism. Schooling, they state, must therefore change from being an affirmation of the old capitalism, promoting respect for hierarchy and fixed forms of knowledge, towards both a new economic order and new forms of learning and knowledge acquisition.

The vision of learning in the future as articulated by the New London Group recognizes globalization and technological change, addressing social and cultural contexts (especially multi-cultural urban environments) while also critically challenging the hierarchical nature of "old capitalism" and, implicitly, educational systems that "sifted and sorted" students to meet the needs of industrial societies. The New London Group, as early as 1996, thus discussed twenty-first century learning, recognized the prevalence of technological change in a globalized world, yet also argued that technology was one tool to be used to educate for a world of social equity and inclusive diversity, where differences in languages and cultures were assets on which to build, not deficits to address.

Much of the Multiliteracies literature since 1996 focuses at least in part on "new economy" context and issues. Kalantzis and Harvey (2002) consider "knowledge workers" to be the "typical worker in the new economy", arguing that one of the key areas of focus for school systems is to prepare students as "knowledge workers (who) will need to be flexible, possessing problem-solving skills, multiple strategies for tackling a task, and a flexible solutions-orientation to knowledge". Even where some repetition of ideas takes place, the exploration of economy is still evolving, gradually in some cases (Kalantzis and Harvey, 2002), rapidly in others (Luke, 2003), or with a singular yet crucial focus on the dominance of English (Warschauer, 2000). There is also a greater lucidity and clarity in this focus over time, as a variety of authors cement their view that there exists an essential connection between Multiliteracies pedagogy and economic contexts.

Since 1996, much of the Multiliteracies literature has expanded the original thinking while also retaining a critical edge which can be a challenge to established orders. Perhaps it is this critical challenge that provides the reason for the limited acknowledgment of its theory and minimal implementation of its practices by many policy-makers. As one example, Gee (2003), in his exploration of the use of video games to promote learning and literacy, offers a challenge to the political and corporate world's power elites, which he sees as keeping the poor in their place as low-paid service workers:

It is not surprising that many politicians, policy-makers, and their academic fellow-travellers who think poor children should be content with schooling for service jobs don't like video games. They say they don't like them because they are violent. But in reality, video games do violence to these people's notions of what makes learning powerful and schools fair. (p. 205)

5. BC teachers' 21st century teaching practices

The tepid and vague acknowledgment of current teacher practices by ministry presenters on 21st century learning is of concern because it indicates a limited awareness of what currently exists. There are many innovative practices which might be considered as exemplifying 21st century learning approaches in BC's public schools. Being unaware of existing innovations in BC schools while promoting new concepts seems somehow contradictory—promoting the concept but ignoring it where it exists in BC's schools.

Below are just a few examples of BC public school teachers' innovative 21st century practices:

- **The Multiliteracies project**

This project, a collaboration of UBC, the Vancouver School Board, and the BCTF between 2003 and 2007, as well as the University of Toronto and several Ontario and Quebec school boards, is introduced on the project web site as follows:

The Multiliteracy Project is a national Canadian study exploring pedagogies or teaching practices that prepare children for the literacy challenges of our globalized, networked, culturally-diverse world. Increasingly, we encounter knowledge in multiple forms—in print, in images, in video, in combinations of forms in digital contexts—and are asked to represent our knowledge in an equally complex manner. Further, there is international recognition that Canada's linguistic and cultural diversity are a source of its strength, and a key contributor of Canada's social and economic well-being. The challenge is to assist our schools in helping students to achieve a more diverse folio of literacies.

The term 'Multiliteracies' was coined by the New London Group (1996) to highlight two related aspects of the increasing complexity of texts: (a) the proliferation of multimodal ways of making meaning where the written word is increasingly part and parcel of visual, audio, and spatial patterns; (b) the increasing salience of cultural and linguistic diversity characterized by local diversity and global connectedness.

Twenty-five elementary and secondary schools were involved in this three-province collaboration, with ten Vancouver elementary and secondary schools participating. Vancouver-based examples of twenty-first century learning in the Multiliteracies research included:

- Byng Secondary School's multi-modal analysis of Shakespearian sonnets using video and Lego, incorporating short-stop animation¹⁹.
- Mount Pleasant and Seymour elementary schools' use of picture communication symbols to build conceptual understanding, to apply within regular curriculum units, while also exploring new forms of visual communication tools in new technology.²⁰
- Kitchener Elementary School's use of visuals and technology to foster social responsibility, using art, existing digital images, and software to create images.²¹

¹⁹ <http://www.multiliteracies.ca/index.php/folio/viewDocument/222/9431>

²⁰ <http://www.multiliteracies.ca/index.php/folio/viewDocument/44/3668>

²¹ <http://www.multiliteracies.ca/index.php/folio/viewDocument/45/3673>

There are many schools today which continue to develop practices which reflect or connect to Multiliteracies practices, examples of good BC teacher practices consistently ignored and unsupported by a government that now sees twenty-first century learning as an imperative.

- **Technology innovation—Interactive Whiteboards**

While there are undoubtedly many examples of the innovative use of interactive whiteboards in BC schools, Livingstone Elementary in East Vancouver exemplifies innovation using technology which is fundamentally changing both teaching and learning. With an interactive whiteboard in every classroom, teachers in the school have developed new curriculum units and engaged in collaborative inquiry for several years to extend their reflection and understanding of changing practice. The teachers believe that their changing teaching practices have increased the engagement of all learners, from the gifted to those with special needs, while also creating a role for teachers which is more facilitative than directive. Using a Wiki to share ideas, two of the teachers considered how their practices were changing, and stated:

Smartboards, in addition to helping students, are a fabulous tool for teachers. We are able to address the ‘teachable moment’ instantly. Whether we use images from the gallery, internet sites, or audio files, we are able to answer and expand upon the students’ questions and concerns. In the past, many opportunities are missed because we didn’t have a book, poster, or song to show as an example. The access to information allows us to tackle more sophisticated topics in our class. The critical issues are introduced through text, but brought to life with Smartboards. Our students are now able to retain the big ideas of the topic because they remember the video or audio clips that we had thought were just supportive. Also, we are noticing the transferring of information to other classes. Our students are making sophisticated connections that we had never expected. Their learning is much deeper and seems to be retained longer than pre-Smartboard time. (p. 11)

Livingstone’s use of technology is pervasive but is only a tool to further good teaching and learning practices. Their innovation is largely unsupported by any provincial policies to access equipment or improved Internet connections. Ironically, some of the equipment was purchased from funds reallocated from unpaid teacher salaries after a two-week strike, a strike provoked by chronic government underfunding and lack of support for meeting learners’ needs.

Livingstone’s Inquiry team has presented at the Canadian Society for Studies in Education (Naylor et al, 2008) and has been supported by UBC education faculty and BCTF Research. Their work reflects innovation, significant use of technology, collaboration, and networking, all aspects of twenty-first century educational practices.

- **BCTF Provincial Specialist Association (PSA) initiatives**

Teacher unions are often portrayed as one of the major stumbling blocks to creating environments for twenty-first century learning, yet as the two examples above illustrate, the BCTF has been a partner in federally-funded research into Multiliteracies, one form of twenty-first century learning, and partnered Inquiry projects with UBC in BC schools, while also supporting other innovations through its PSAs, three of which are described below:

- i. **The Special Education Association’s Inquiry into differentiated instruction**

This Inquiry group was supported by the BCTF’s Program for Quality Teaching (PQT). Members of the group posed individual inquiry questions, which included:

- Do French Immersion teachers agree that the use of leveled books, as an aspect of Differentiated Instruction in a second-language classroom, leads to increased decoding and comprehension skills?
- How does inquiry engage classroom teachers to use DI strategies?
- What are some of the effective ways support staff can work with a classroom teacher to provide Differentiated learning for students?

In addition, the members of the group collectively designed a Wiki²² to share information with other teachers who might have an interest in differentiating instruction.

Wikis and other Web 2.0 options are increasingly being used by BCTF members engaged in union Inquiry projects—one of which has been an on-line book club using Elluminate conferencing.

ii. The Computer-Using Educators of BC’s (CUEBC) virtual Inquiry Group and conference: “Connecting Diversities Through Technology”

CUEBC’s Inquiry group is the first virtual group sponsored by the BCTF and it links members of the PSA to reflect on teaching, with a focus on the use of Web 2.0 tools in the classroom, as described on the PSA’s web page²³:

We will enhance the communication and collaboration of the group by using various online technologies. These include, but are not limited to, Moodle, Elluminate Live, Blogs, and Wikis. The intent of using these technologies is to model various tools that teachers can use with students.

The action research group will meet online once a month in a distributed learning method. This will allow for participation across the province and include members in remote locations where travel is prohibitive. Throughout the process, we will model and explore the use of a variety of electronic tools that can enhance teacher professional learning at distance.

The 2010 CUEBC conference included a wide range of 21st century learning approaches, while also linking new pedagogy and new technology to diversity in society, a focus either missing from or minimal in many twenty-first century learning discussions.

Some topics covered in workshops included:

- Wireless trends in education
- Redesigning 21st century classrooms
- Creating visual supports that enable all learners
- Aboriginal astronomy: digital resources and the oral tradition
- Saving time and effort with virtual classrooms
- Using Robotics to enhance our curriculum: promoting Science, Technology, Engineering, and Math.

iii. Teacher Librarians’ discussion paper, “A Framework for Information Literacy and the 21st century learner.”

BC Teacher-Librarians have engaged in cutting-edge innovations for some years; in their (October, 2010)²⁴ discussion paper they state:

²² <http://seabc.pbworks.com/w/page/5955481/FrontPage>

²³ <http://cuebc.ca/cue/?p=30>

Today's students learn in a dynamic world where information changes and expands as fast as technological innovation. Information that grows exponentially and comes in multiple formats is presented without prior expert editing for truth or reliability, often without logical organization, and frequently with a very short 'shelf-life.' Learning in the Information Age is very different from the kind of learning that took place prior to the advent of the computer. (p. 3)

This paper reflects the forward thinking of many BC teachers, in the sense that it examines necessary changes in teaching to support learning in a rapidly-changing world. Ironically, the ranks of teacher-librarians have been decimated in recent years. With 235.98 (25.6%) fewer FTE teacher-librarians in BC schools in 2009 than in 2001, one cadre of teachers most likely to be able to systemically support classroom teachers' twenty first century teaching practices has been significantly cut and their work and role marginalized. Yet even while government funding has forced districts to cut teacher-librarian positions, those teachers who are left consistently focus on ways to innovate and meet changing learning needs by promoting student Inquiry approaches now endorsed by the UK's Innovation Unit at their recent presentations at the BCSSA conference. The teacher-librarians' paper shows teacher and union at least abreast of if not ahead of imported promotion of Inquiry learning.

These are but a few examples of innovations developed by BC's public school teachers to meet the needs of their students in 21st century schools. These innovations could be better supported by the province of BC, which has largely failed to fund, document, and share such innovations, and has also failed to build networks and Inquiry on a provincial scale which might extend 21st century teaching and learning practices in BC's schools. Building innovation in the 21st century should consider what teacher, school district, and teacher union innovations currently exist, and build on them, preferably in collaboration and partnerships involving school districts, universities, and the BCTF. Such collaborations serve multiple purposes in terms of both practical innovation and collaboration, while also allowing for a more inclusive and expanded debate on how to meet all learners' needs in BC's public schools.

Discussion

Baby, i've seen it all before.
Know that i've seen it all before.
Know that i've seen it all before.
I ain't gonna be your fool any more.
(Amos Lee)

Some educators may well empathize with Amos Lee's reflections while perhaps finding it hard to resist correcting his lack of capitalization. Many veteran teachers have seen waves of "innovation" heralded, have their day in the sun, and gradually fade into the proverbial sunset or be summarily dismissed by change-seeking governments. For some teachers, the ideas about twenty-first century learning are just another fad foisted on them. For others, they offer stimulating ideas and approaches to incorporating new ways of teaching and learning that will engage and excite students.

²⁴ <http://bctf.ca/bctla/pub/documents/Points%20of%20Inquiry/PointsofInquiry.pdf>

Some teachers have incorporated aspects of 21st century learning into their teaching practices, and it can be argued that those teachers in BC are ahead of their government, who only recently appeared to realize that the 21st century had arrived, and immediately enlisted foreign help in the shape of the UK-based Innovations Unit to show them what to make of it.

How, then, might a teacher union consider approaches and issues linked to learning in the 21st century? Some argue that if we ignore it, it will go away. Others suggest embracing the opportunity both to engage members and to influence directions.

In order to consider future directions, four sets of questions are posed. These will very likely not be all the right questions, and others may have different ones to ask, but they are offered to stimulate ideas and conversations about 21st century learning within the union.

i. What should be “in the frame” of a vision for 21st century learning?

- The case made in this paper is that the frame of 21st century learning must be widened to consider the needs of the planet and all its peoples, and to build a just and civil society. Is this frame appropriate? What else might be considered?
- How to include environmental and social justice issues²⁵ within the frame, so that consideration of inclusion and social cohesion in the widest sense becomes part of 21st century learning?

ii. How might systemic changes be made to support 21st century learning?

The roles of government and ministry are crucial in addressing this question, but other “system supports” include school districts and teacher education programs, both pre- and in-service. Systemic changes may fall into several categories, including:

- **Governance:** Will public schooling be maintained or will privatization be encouraged? Will school districts survive or be eliminated if sites control their own governance and administration?
- **Accountability:** If large-scale testing is antithetical to 21st century learning, and formative assessment for learning should be encouraged, how can future approaches to accountability accommodate these contradictions?
- **Technology support:** What will this look like in terms of technology and Internet access in schools? How will new technologies be incorporated, monitored for appropriateness and impact on student learning, and funded?
- **Teacher education:** What might pre- and in-service teacher education consider to support new teaching approaches that incorporate new technology in the learning process, yet not lose sight of the fundamentals of pedagogy?
- **Sustainability and social justice:** Why should the environment and social justice be central to 21st century learning and how might it be included in new curriculum?
- **Subject hierarchies:** Should the current core/elective subject divide be reconsidered, as many elective subjects such as Art, Music, and Computer Studies link directly to new economy work?

²⁵ See the BCTF “Social Justice lens” at: <http://bctf.ca/uploadedFiles/Public/SocialJustice/Publications/SJ-Newsletter/Summer2010.pdf>

- **Collaboration:** Might 21st century learning concepts provide a platform for an improved level of collaboration and partnerships to explore 21st century learning practices and issues involving school districts, the BCTF, the Ministry of Education, and universities?

iii. What changes in individual teaching practice might support 21st century learning?

- How do teachers currently engage in teaching as facilitation, and how do they see the approach evolving?
- How might “Inquiry” learning be furthered across grade levels?
- What changes to assessment practices might be needed?
- How might teachers incorporate the use of technology to improve and enrich student learning?
- When should the use of technology be limited or restricted?

iv. How might the BCTF position itself to best support teachers’ and learners’ needs?

- What is the union’s central and local role in addressing provincial and district systemic issues in 21st century learning?
- How might the union engage in conversation and discourse with its members and the wider community to consider future approaches to education?
- Might its PSAs offer leadership and focus in terms of teaching practices, professional development, and networking?
- Can the union’s Inquiry support include and extend our understanding of new practices?

Conclusion

This paper is one effort to widen the debate on 21st century thinking. It is necessarily limited in its scope, as the 21st century literature is considerable and quickly evolving. New perspectives will emerge and some existing ones may not have been considered here, so that the frame offered in this paper is tentative and likely somewhat subjective. Teaching using methods such as Universal Design will also evolve, so that, with changing perspectives and practices, this effort to engage teacher union members’ thinking is located at a very preliminary stage of the discussion. But, it is hoped, it offers some additional ideas to engage in conversation and discourse both within and beyond the union.

Central to this paper is the idea of “widening the frame” to consider what forms of learning will meet the needs of students and benefit our local and national societies and economies, while developing a sustainable and equitable world. To answer the question “What lenses should we use to consider 21st century learning?”, the paper aims to expand the discussion from a focus on narrowly-defined pedagogy and technology to consider a range of ideas, contexts, and influences, including what kind of society and what kind of world we want and need for our current populations and for future generations.

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