

“Overschooled but Undereducated:
how the crisis in education is
jeopardising our adolescents”

John Abbott
President
The 21st Century Learning Initiative

Supporting documentation for this discussion can be downloaded
from the website: www.21learn.org

22nd October 2010
Whistler
British Columbia

Earlier presentations in British Columbia:

Spring 2002

“What kind of education for what kind of world – do we want our children to grow up as battery hens or free-range chickens?”

March 2004

“Lieutenant Peter Puget, the grain of the brain and modern society’s failure to understand adolescence”

Various presentations across British Columbia from 2005, including the annual Superintendents’ Conference in 2007 and individual conferences in 10 school districts subsequently.

Richmond District Learning Principles - Revised February 12, 2009

- Learning is an active process that requires the engagement of learners to construct meaning.
- Learners link new information with prior knowledge and transfer their learning to different contexts at different rates.
- Learning is both an individual and group process.
- A safe and supportive environment enables learners to take intellectual risks.
- Learning is a process that requires curiosity, exploration, feedback and reflection.
- Effective feedback is timely, ongoing and specific, related to established standards and gives learners opportunities to apply the information to optimize their learning.
- Learning is enhanced when it is personally relevant and addresses individual learning styles.
- Effective learners are clear on learning outcomes, understand what meaningful progress looks like, and believe that goals are achievable.
- Learning requires motivation and perseverance.

Windsor Castle 10th December, 1563

Not long after sitting doune, I haue strange newes brought me, sayth Mr Secretarie (Sir William Cecil) this morning, that diuerse Scholers of Eaton, be runne awaie from the Schole, for feare of beating. Wherupon, M. Secretarie tooke occassion to wishe, that some more discretion were in many Scholemasters, in using correction, than commonlie there is. Who many times, punishe rather, the weaknes of nature, than the faiult of the Scholar. Whereby, many Scholers, that might else proue well, be driuen to hate learning, before they knowe, what learnign meaneth: and so, are made willing to forsake their booke, and be glad to be put to any other kinde of liuing.

Sir William Peter, as one somewhat seuerer of nature, said plainlie, that the Rodde onelie, was the sworde, that must keepe, the Schole in obedience, and the Scholer in good order.

(But) Mr Wotton, a man milde of nature, with soft voice, and few wordes, inclined to M. Secretaries judgement, and said, in mine opinion, the Schole-house should be in deede, as it is called by name, the house of playe and pleasure, and not of feare and bondage. And therefore, if a Rodde carie the feare of a Sworde, it is no maruell, if those that be fearefull of nature, chose to forsake the Plaie, than to stand alwaies within the feare of a Sworde in a fonde mans handling.

M Secretarie said very wisely, and most truely, many yong wittes be driuen to hate learninge, before they know what learninge is. I can be good witness to this my selfe: for a fond Scholemaster, before I was fullie fourtene yeare olde, draue me so, with feare of beating, from all loue of learninge, as nowe, when I know, what difference it os to haue learnigne, and to haue litle, or none at all, I feele it my greatest greife, and finde it my greatest hurte.

(summarising the rest of the statement in modern English, Sir William Cecil said...) “So find me a good school-master who can teach and encourage my grandchildren in a way that I never enjoyed and I will pay him three times what the other kind of school teacher demands. Let my grandson develop ‘hard wits’, not ‘quick wits’.”



The most crucial location in space and time (apart from the big bang itself) could be here and now. I think the odds are no better than fifty-fifty that our present civilisation on Earth will survive to the end of the present century... What happens here on Earth, in this century, could conceivably make the difference between a near eternity filled with ever more complex and subtle forms of life and one filled with nothing but base matter.

Sir Martin Rees, President of the Royal Society 2003

Two questions:

What was your most powerful
ever learning experience?

How did this change the way you
think about how you learn?

An email dated 5th January 2006

Dear 21st Century learning Initiative,

I'm not quite exactly sure why I am emailing you, but I suppose I could use all the support I could get. I am a 15 year old guy from the suburbs of Vancouver, Canada...

An email dated 27th November 2006

Our education system is in a dire situation. Based on 19th century needs, the system has become cluttered, complex, bureaucratic, and most importantly nearly useless. The only reason most people stay in school is because it's simply it's much easier to get a well paid job by getting a degree. To get a degree, you need to be accepted into college or university. To get accepted you need to graduate grade school with good grades. And there's where it begins. Focus shifts from teaching and raising an aware, creative, inspired and capable creature, to advancing to the next grade. It's not about the child, it's not about his or her capabilities; it's about the grades. They have become the one single and most important variable in a student's school experience.

The email continued...

To change the way our education system works, we've got to start from the ground up. Not only do we need to determine how these kids learn and how that affects the curriculum and learning styles, but we need to realign our school workers mind's to be set on the goal of the student and change the public's perspective on what school is about.

To MEANDER... To follow a winding course; to wander aimlessly.

A MEANDER (geographic term)... A bend in a winding river, resulting from helicoidal flow.

HELICOIDAL... A movement of water like a corkscrew, eroding from one side, and building up on the other; a natural process of adjusting to constantly changing conditions.

The Danish Nobel winning Physicist, Neils Bohr, understood this as he remonstrated with a PhD student... “You’re not thinking, you’re just being logical”.

HELICOIDAL THINKING ... is dynamic; instantly reacting to changing circumstances. Over hundreds of thousands of generations the human brain has come to work in such a natural, dynamic, meandering way.

So this lecture will, for very good reasons, be a “meander”... taking ideas from one place and building them up in another in response to changing circumstances, and creating new meaning.

The Creation Story

An ingenious narrative compresses the age of the planet into the six days of the Biblical creation story (David Brower).

In this scenario Earth is created on Sunday at midnight. Life in the form of the first bacterial cells appears on Tuesday morning around 8:00am. For the next two and half days the microcosm evolves, and by Thursday at midnight it is fully established. On Friday around 4:00pm, the microorganisms invent sexual reproduction, and on Saturday, the last day of creation, all the visible forms of life evolve.

Around 1:30am on Saturday the first marine animals are formed, and by 9:30am the first plants come ashore. At 10 minutes before five in the afternoon the great reptiles appear, roam the earth in lush tropical forests for five hours and then suddenly die around 9:45pm.

Shortly before 10:00pm some tree-dwelling mammals in the tropics evolve into the first primates; an hour later some of those evolve into monkeys. Around 11:40pm the great apes appear.

Eight minutes before midnight the first Southern apes stand up and walk on two legs. The first human species, *Homo habilis*, appears four minutes before midnight, evolves into *Homo erectus* half a minute later and into archaic forms *Homo sapiens* 30 seconds before midnight.

The modern human species finally appears in Africa 11 seconds before midnight, and in Europe five seconds before midnight. Written human history begins around two-thirds of a second before midnight.

Fritjof Capra, *The Web of Life*, 1996

The Descent of Man

Studies in genetics suggest that the split with the Great Apes occurred seven million years ago. At twenty years to a generation that is three hundred and fifty thousand generations ago. In all that time the genetic structure of humans has come to differ from the Great Apes by less than 2%.

Three hundred and fifty thousand generations is, at a minute a generation, equivalent to the number of minutes we are, on average, awake for in a year.

Before the Dawn: Recovering the lost history of our ancestors. Nicholas Wade

THE 2% DIFFERENCE: APES, HUMANS AND BOEING 747s

Our bodies and minds are not of recent origin. They are the direct consequence of millions of years of surviving in Africa and adapting to the dramatic changes this continent has seen in the course of the last five million years. The way we interact today at a social and cultural level is in many ways the result of organisational skills developed by our hominid ancestors in Africa over millions of years.

Cradle of Humankind

Lee R. Berger South Africa, 2002

Evolutionary Intelligence

"Human beings, together with all their likes and dislikes, their senses and sensibilities, did not fall ready-made from the sky; nor were they born with minds and bodies that bare no imprint of the history of their species. Many of our **abilities** and **susceptibilities** are specific adaptations to ancient environmental problems, rather than separate manifestations of a general intelligence for all Seasons."

John D. Barrow
The Artful Universe, 1996

Neural Darwinism

Professor Gerald Edelman of San Diego gained his Nobel Prize for work on the human immune system in which he showed that, as a result of chemical interaction in the brain transmitted genetically from generation to generation, the human body is born with a vast number of specific antibodies, each of which has the capacity to recognise and respond to particular types of harmful viruses.

The immune system doesn't just build new responses every time a new threat appears – it simply searches its vast repertoire of defence mechanisms built up in deep evolutionary history until it finds an antibody that is appropriate.

In 1992 Edelman argued that human learning proceeds in a very similar fashion. Change in the brain occurs solely through the interaction of internal mental processes with those aspects of the environment that attract its attention. In other words the drive comes from within the brain, not outside.

It is rather like the way organisms respond to the rich layered ecology of the jungle environment. What happens in the jungle is the result of natural selection. All trees have the innate capacity to reach the sunlight; those that do so thrive and reproduce – the others simply die.

Edelman argued that those genetic processes which have evolved since we parted company with the Great Apes, have created a human brain which is fully equipped at birth with the basic sensory and motor components that enable each individual to function successfully in the physical world.

An infant brain doesn't have to learn how to recognise specific sounds, or the way a string of words forms a sentence, because such basic neural networks are operational at birth. We don't have to teach a child to walk or talk... as each new challenge presents itself, the brain searches through its enormous repertoire of potential processes for that most suited for the purpose.

Not all individuals read these instructions as effectively as others, so not all adaptations are complete or affective.

From a biological perspective learning becomes a delicate but powerful dialogue between genetics and the environment. The whole process is dynamic and continuous.

Such a model of our brain is especially intriguing for it suggests that a jungle-like brain might thrive best, not in classrooms designed so that teachers can deliver a specialised segment of a pre-determined curriculum, but by recognising that however good a class or a school may be, it can never be good enough to give children the width of experience and challenge they need to activate their phenomenal learning capabilities.

Our ancestors, after all, came from those jungles, not from something that resembles a shopping mall.

Tell me, and I forget;
show me, and I remember;
let me do and I understand.

Confucius

Oh God, oh my God, how I suffered! What torments and humiliations I experienced. I was told that because I was a mere boy I had to obey my teachers in everything. I was sent to school. I did not understand what I was taught, and was beaten for my ignorance. I never found out what use my education was supposed to be.

“Classes are boring, ‘cos we don’t have to think about what we are doing. We’re just told to copy stuff down off the board or from what the teacher tells us. It makes us lazy... in fact, sorry to say this, but it’s you teachers who make us lazy.”

Toronto Canada, August 2006

I learned most, not from
those who taught me,
but from those who talked with
me.

St. Augustine
6th Century

John Milton

(Puritan philosopher, theologian and
parliamentarian)

***“I call a complete and generous education
that which equips a man to perform
justly, skillfully and magnanimously all
the offices, public and private, of peace
and war” (1644)***

“Daily experience shows that it is energetic individualism which produces the most powerful effects upon the life and action of others, and really constitutes the best practical education. Schools, academies and colleges, give but the merest beginnings of culture in comparison with it. Far more influential is the life-education daily given in our homes, in the streets, behind counters, in workshops, at the loom and the plough, in counting-houses and manufactories, and in the busy haunts of men”.

Self-Help, 1859

“Making Thinking Visible”

"In traditional apprenticeship the expert shows the apprentice how to do a task, watches as the apprentice practices portions of the task, and then turns over more and more responsibility until the apprentice is proficient enough to accomplish the task independently. That is the basic notion of apprenticeship: showing the apprentice how to do a task and helping the apprentice to do it. There are four important aspects of traditional apprenticeship: modelling, scaffolding, fading, and coaching (dialogue)."

Cognitive Apprenticeship: Making Thinking Visible
Allan Collins, John Seely Brown, and Ann Holum

The neural basis for Cognitive Apprenticeship

“As we build networks and patterns of synaptic connections when we are very young, so we build the framework which will 'shape' how we learn as we get older; such 'shaping' will significantly determine what we learn – it will be both an opportunity, and a constraint. The broader and more diverse the experience when very young, the greater are the chances that, later in life, the individual will be able to handle open, ambiguous, uncertain and novel situations.”

Stephen J. Quartz and Terrence Sejnowski
The Salk Institute, San Diego, California.

Adolescence – a return to the biology of the brain

The findings of functional Magnetic Resonance Imaging show the extraordinary change in the adolescent brain from the clone-like learning of prepubescent children, to young people who can think for themselves.

Crazy by Design

We have suspected that there is something going on in the brain of the adolescent, apparently involuntarily, that is forcing apart the child/parent relationship. What neurologists are discovering challenges the conventional belief held until only a year or so ago, that brain formation is largely completed by the age of twelve. Adolescence is a period of profound structural change, in fact “the changes taking place in the brain during adolescence are so profound, they may rival early childhood as a critical period of development”, wrote Barbara Strauch in 2003. “The teenage brain, far from being readymade, undergoes a period of surprisingly complex and crucial development.” The adolescent brain, she suggests, “is crazy by design.”

Adolescence

From the earliest of times the progression from dependent child to autonomous adult has been an issue of critical importance to all societies.

The adolescent brain, being “crazy by design,” could be a critical evolutionary adaptation that has built up over countless generations, and is essential to our species’ survival. It is adolescence that drives human development by forcing young people in every generation to think beyond their own self-imposed limitations and exceed their parents’ aspirations. These neurological changes in the young brain as it transforms itself means that adolescents have evolved to be apprentice-like learners, not pupils sitting at desks awaiting instruction.

Youngsters who are empowered as adolescents to take charge of their own futures will make better citizens for the future than did so many of their parents and their grandparents who suffered from being overschooled but undereducated in their own generations.

DON'T FENCE ME IN
(Cole Porter)

Oh, give me land, lots of land under starry skies, Don't fence me in
Let me ride through the wide open country that I love, Don't fence me in
Let me be by myself in the evenin' breeze
And listen to the murmur of the cottonwood trees
Send me off forever but I ask you please, Don't fence me in
Just turn me loose, let me straddle my old saddle
Underneath the western skies
On my Cayuse, let me wander over yonder
Till I see the mountains rise
I want to ride to the ridge where the west commences
And gaze at the moon till I lose my senses
And I can't look at hovels and I can't stand fences
Don't fence me in, no
Pop, oh don't you fence me in

“Schools” in the Future: What has to change, and why

A Paper written by The 21st Century Learning Initiative for the British Columbian Ministry of Education, April 2010.

From the perspective of all this recent research most of the schools that today's children attend were designed when prevailing cultures assumed that children were born to be taught rather than to learn. Which is why, for so many children, the wonder of learning has been replaced by the tedium of trying to remember what they were told by somebody else about something that really didn't interest them very much in the first place.

Today's western education system is based on an earlier Anglo model of schooling in which age-related classes assumed to be progressing at a uniform rate; skills and knowledge delivered via subject-specific disciplines; a custodial role for social development confused with a degree of willingness with which a child accepted the ethos of the school; more funds allocated to the education of older pupils leaving the youngest children to be taught in the largest classes; the increased marginalisation of home and community as an integral component of learning; the retention of teenagers in school to "save" them from the turmoil of adolescence, and the training of teachers being more concerned with the preparation of subject specific instruction than with the development of pedagogic strategies informed by philosophy and the research into the nature of human learning.

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- Learning is enhanced when it is personally relevant and addresses individual learning styles.
- Effective learners are clear on learning outcomes, understand what meaningful progress looks like, and believe that goals are achievable.
- Learning requires motivation and perseverance.

To your learning principles I would add three...

- **The brain is empowered** by the experience of its ancestors with “predispositions” opening up like windows of opportunity at those stages of life which evolution has found are the most appropriate to the individual’s development.
- **The adolescent brain** is a critical evolutionary adaptation that has built up over thousands of generations, and is essential to our species’ survival. Adolescence forces young people in every generation to think beyond their own self-imposed limitations, and exceed their parent’s aspirations. Adolescence is an opportunity, not a threat.
- **Given the inherent limitations** of schooling it seems essential for a child to have an intellectual life outside school. Thus equipped, the child is in a position to use schooling as a source of learning opportunities without being drawn into short-cut strategies that work well for handling school-based tasks but often lead nowhere in the life-long development of expertise.

I would urge you to swat up on three concepts:

1. Constructivism
2. Cognitive apprenticeship
3. Subsidiarity

The elements of change required within a national or provincial system can briefly be described as follows:

1. **Individualized learning** paths versus pre-programmed paths from which students choose their course of study.
2. A much greater emphasis on **experiential and situational learning**, especially as students get older.
3. A much greater emphasis on **constructivist** and inquiry-based practices.
4. A much greater use of **community members** and organizations in the direct delivery of educational programs, and in the support of apprentice-like learning outside the school.
5. The evolution of the teacher from the role of **instructor** when children are young to a much more complex and professional role of learning **facilitator** as students get older.

6. A **student-teacher ratio** that varies greatly depending on age and learning activity (this is NOT about class size as we know it) – see “comparison of current student/teacher ratios with proposed ratios” as drawn up by Jeff Hopkins, added as an appendix, together with “A Day in the life of a Secondary Student”.
7. A de-emphasis of courses from K to 12 and a move toward ensuring deep learning that matches developmental levels, and is naturally **interdisciplinary**.
8. Rich assessment and reporting based on **competencies** rather than courses or disciplines, and that uses language and artefacts rather than scores to show achievement.
9. Post Secondary transition based on the demonstration of **competencies** rather than marks in pre-requisite courses.
10. A sliding scale of student dependency on teacher and school-as-place that decreases with age, so allowing **growth in student choice and responsibility**.

Are you up for it?

Note this verbatim report of a meeting at the Prime Minister's policy unit in Westminster in March 1996:

"Much to my surprise I can't really fault your theory. You are probably educationally right; certainly your argument is ethically correct.

But the system you're arguing for would require very good teachers. We're not convinced that there will ever be enough good teachers. So, instead, we're going for a teacher-proof system of organising schools - that way we can get a uniform standard."

Remember Sir Martin Rees's caution:

The most crucial location in space and time (apart from the big bang itself) could be here and now. I think the odds are no better than fifty-fifty that our present civilisation on Earth will survive to the end of the present century... What happens here on Earth, in this century, could conceivably make the difference between a near eternity filled with ever more complex and subtle forms of life and one filled with nothing but base matter.

Add your Canadian warning:

“If civilisation is to survive it must live on the interest, not the capital, of nature.

Ecological markers suggest that in the early 1960’s, humans were using 70% of nature’s yearly output; by the early 1980’s we’d reached 100%; and in 1999 we were at 125%.”

Ronald Wright
A Short History of Progress 2004

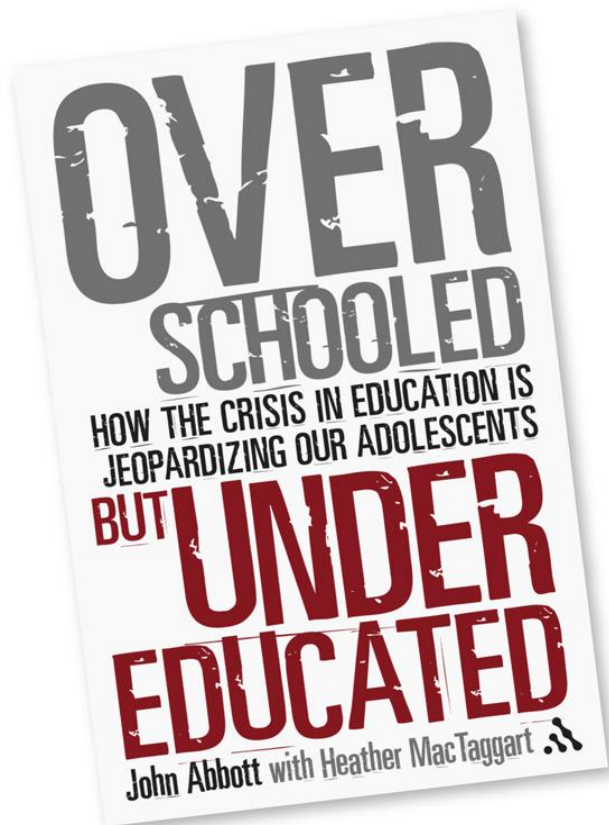
**Time is running out, so
remember this:**

*We have not inherited this world from
our parents. We have been loaned it by
our children.*

Native American Tradition

As they grow the children are increasingly looking to us to help them shape the future





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“Schools for the future”, “Peter Puget and Adolescence” and this lecture can be downloaded as pdf files from the website



Separate slides to be used for discussion purposes follow...

The factory, rather than a moral, learning community, is the inspiration for traditional models of learning. When the factory was touted as the ideal organisation for work and when most youngsters were headed for its assembly lines, making a mass public education system conform to the model of the factory may have seemed like a great achievement.

The limitations of such a traditional factory model of education have become manifest and they are crippling. The traditional model of schooling is incompatible with the idea that students are workers, that learning must be active, and that children learn in different ways and at different rates.

Dr Albert Shanker, formerly President, American Federation of Teachers

By the time children reach the age of formal schooling, they have forged elaborate learning skills and their minds are prodigiously complex repositories of knowledge.

Unfortunately the education system – based as it is on outdated, incorrect, over-simplified psychological principles – all too often collides catastrophically with children’s natural learning skills, teaches them to mistrust and repress those innate skills, and moves countless numbers of children through 15,000 hours of systematic training in learning not to learn.

Schooling

Silvia Farnham-Diggory

If we change our representation of intelligence, learning and teaching... We change relationships between students and teachers, schools and the community... And our representation of what the classroom and schools should look like. To push for change without continuing to deepen our understanding of what we are doing will only intensify the problems we seek to solve.

Schools for thought

John Bruer

Princeton, New Jersey

This township believes in functional literacy, that is the ability to be conformable with all the changes in a rapidly evolving society.

Comfort depends on mastering the skills of learning, and knowing that it is the individual's responsibility to develop this for a further 70 years or more. It depends on four key skills:

**the ability to think,
to communicate,
to collaborate,
and to make decisions**

So, Now...

Formal schooling, therefore, has to start a dynamic process through which students are progressively weaned from their dependence on teachers and institutions, and given the confidence to manage their own learning, collaborating with colleagues as appropriate, and using a range of resources and learning situations.

The challenge now is for communities to begin building new organisations for learning that handle both the skills of the past and enable the understanding and coordination of constant change, life-long learning, diversity and complexity so as to prepare young people to participate in a vibrant and democratic civil society.

"Much to my surprise I can't really fault your theory. You are probably educationally right; certainly your argument is ethically correct.

But the system you're arguing for would require very good teachers. We're not convinced that there will ever be enough good teachers. So, instead, we're going for a teacher-proof system of organising schools - that way we can get a uniform standard."

Verbatim report of conclusions of presentation
made to the Prime Minister's Policy Unit, Westminster
March 1996

Home, School and Community

"No curricular overhaul, no instructional innovation, no change in school organization, no toughening of standards, no rethinking of teacher training or compensation will succeed if students do not come to school interested in, and committed to, learning..."

We need to look, not simply at what goes on inside the classroom, but at students' lives outside the school's walls."

Laurence Steinberg, 1997

It has been the lack of real understanding about education and learning amongst teachers that has allowed successive governments to bully the profession. Teachers undoubtedly need to understand the theory of learning. Deprived of a real understanding of both pedagogy and policy they are simply parroting the latest curriculum directives.

The most crucial location in space and time (apart from the big bang itself) could be here and now. I think the odds are no better than fifty-fifty that our present civilisation on Earth will survive to the end of the present century... What happens here on Earth, in this century, could conceivably make the difference between a near eternity filled with ever more complex and subtle forms of life and one filled with nothing but base matter.

Sir Martin Rees, President of the Royal Society 2003

*"The biggest crisis we are facing is a **Crisis of Meaning**. The tremendous social changes of the last 100 years have stripped modern society of that which gives us meaning be it in our roots to our ancestors, religions, spirituality, our relationship to nature...*

Within this Crisis of Meaning our young people are facing a MORAL crisis - a crisis of values. Without these anchors young people no longer understand the value of perseverance, learning for learning's sake etc.

Instead our daily lives are filled with a pursuit of money and temporary ecstasy. Both of these goals are unfulfillable and result in a misguided frenzy in the pursuit of the next thrill, or in depression."

Dr Rolando Jubis, Jakarta, 2000

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So remember this:

We have not inherited this world from our parents. We have been loaned it by our children.

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