Innovation for Development in Learning and Sustainability

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EDUCATION VERSUS LEARNING:

Changing Conceptions of Agency by Using the Future Differently

Riel MILLER | UNESCO
Preface

“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.” Ivan Illich, 1971
1988

VISION 2000: QUALITY AND OPPORTUNITY

A REVIEW OF THE MANDATE OF ONTARIO'S COLLEGES

1996

Measuring What People Know
SCHOOLING FOR TOMORROW
What Schools for the Future?
EDUCATION AND SKILLS

‘unique creation’

Possible futures
Four scenarios for 21st century schooling
Rit Miller, OECD
Tom Bentley, Demos

National College for School Leadership
If school’s over, what’s next? A scenario for learning in a Learning Intensive Society

Riel Miller

Education and Economic Growth: From the 19th to the 21st Century

Executive Summary
The research summarized in this article shows that schooling is necessary for industrial development. The form of schooling that emerged in the 19th century generates specific cognitive, behavioral and social knowledge that are critical ingredients for the way industrial societies organize:
- production and consumption
- daily life in cities and nations
- the size and fitness of the population for work
- the creation and use of knowledge.

Therefore, it is documented that:
- Schooling is a necessary but not sufficient condition for the spectacular feats of industrial development in the 20th century.
- The trinity of the relationship between schooling and the industrial form of economic growth is confirmed by the technical economics literature.
- Economists have demonstrated that both individuals and societies gain from the investments made in schooling.
Promethean Thinking Deeper Research Paper No.2

Learning Productivity: It is Time for a Breakthrough

Series Director: Rod Miller
Authors: Stefan Bergstein, Rod Miller, Ika Tsuni
Date: January 2011
Sponsored by: Jim Wynn, Chief Education Officer, Promethean

Promethean Thinking Deeper Research Papers Series sponsors leading experts to conduct and report on cutting-edge thinking and state-of-the-art global academic/policy knowledge with respect to the role of new technologies (innovative tools and organisation) in meeting the challenges of learning in the 21st Century.
PART 1. A CHANGING CONTEXT

- Identity, capacity to be free
- Embrace complexity
- Mobile, ubiquitous, accessible
Identity, capacity to be free
Embracing Complexity
Murmuration: Starlings Flying in a Flock
Imagine Clouds of Unique Creation
Flows of Collaboration and Experience
Local and Global, Multiple Dynamic Communities
Birth, Death, Entry, Exit - Heterarchical

Mobile, ubiquitous, accessible
PART 2. KNOWLEDGE PRODUCTION

LIVING KNOWLEDGE (stock)

PUBLIC SECTOR Preservation

PRIVATE SECTOR Preservation

DISCOVERY (flow)

Net new

Non-institutional
PART 2. KNOWLEDGE PRODUCTION

LIVING KNOWLEDGE (stock)

Source: Etienne Wegner
Education push

Transmit what future generations need to know

Prepare for future citizenship, future jobs, future life
Learning pull

Seeking to know when you want to know

1. interruption in routine action
2. problem definition and conceptualization
3. definition of a working hypothesis
4. inference and thought experiment
5. experimental action

idea, concept

problem solving, return to routine

PART 3. THINKING ABOUT CHANGE:
Is it About Going to the Moon?

SURE It is what we are already doing so it is just extrapolation – bigger, better, faster.

But why go to the moon? What anticipatory assumptions inform this choice?
Productivity Growth US

Continuity and change…

“Gilded Ages” Bubbles | Recessions | “Golden Ages” Booms

1st 1771 Britain | Canal mania | 1793–97 | Great British Leap
2nd 1829 Britain | Railway mania | 1848–50 | The Victorian Boom
3rd 1875 Britain / USA | London funded global market infrastructure build-up (Argentina, Australia, USA) | 1890–95 | Belle Époque (Europe) “Progressive Era” (USA)
4th 1908 USA | Roaring twenties Autos, housing, radio, aviation, electricity | Europe 1929–33 | Post-war Golden Age
5th 1971 USA | Emerging markets dot.com and Internet mania financial casino | 2008–??? | Sustainable global knowledge-society golden age?

Source: Carlota Perez

What we do and how we do it changes…
SUBSTITUTION
COMPLEMENTARITY
Can we think about changes in the conditions of change?

- Change within the system
  - Inside-in
  - Outside-in
- Change outside the system
  - Inside-out
  - Outside-out
PART 4. WHAT IS THE FUTURE AND HOW TO USE IT...
FUTURES LITERACY (FL)
What is Future Literacy?
Futures Literacy

Starting premise: The future only exists in the present as anticipation – for conscious anticipation the future is the fruit of imagination.
Three basic building blocks of Futures Literacy:

FL 1: Anticipatory systems & processes
FL 2: Dimensions of imagining the future
FL 3: Rigorous imagining
FL 1. Anticipatory systems and processes

- Conscious & unconscious
- Feedback & feed-forward
Taking an Anticipatory Systems View


Slide by A. H. Louie, Mathematical Biologist
FL 2. Three dimensions of imagining the future

1. Contingency – preparation (closed)
2. Optimization – planning (closed)
3. Discovery & invention – novelty (open)
Contingency: anticipation of phenomenon amenable both to ex-ante systemic definition and to preparation and/or pre-emption by human agency using a wide variety of simulation methods (closed);
Contingency futures:

a tsunami
Contingency futures: Winning the lottery
Optimization: futures where it is assumed that the past determines the future and hence the conditions of change are assumed to be predictable and so future phenomenon are amenable to probabilistic estimation and, in many cases, open to influence by human agency (closed);
Optimization Futures: Chess, Farming, Assembly Line

- Goal, known in advance & fixed
- Rules, given in advance & fixed
- Resources, given in advance & fixed
Optimization is complicated:
A computer can do it

May 11th, 1997
Deep Blue beat Gary Kasparov.
Machine beats man.
Discovery/creation of the novel emergent: phenomena that are not subject to discovery prior to occurrence, the challenge is to name the unnamed, make sense of the previously unknowable by liberating how we imagine the future.
Embracing complexity: use the future, imagining the potential of the present
FL 3. Rigorous imagining

• Collective intelligence knowledge creation
• Exposing anticipatory assumptions, system boundaries
• Reframing & new questions
Rigorous Knowledge Creation: Action Research The Scientific Method Applied to the Uniqueness of the Future in the Present

- Narrative Capacity
- Collective Intelligence (interactive sense making)
- Capacity to Reframe
In the late 17th Century Anton van Leeuwenhoek discovered bacteria. The microscopes he invented revealed invisible worlds. But it took another two centuries to make sense of this discovery.
PART 5. From education to learning, from push to pull, from engineering to complexity

- Beyond industrial society
- Walking on two legs
- Transformation as experimentation
Functions of the industrial society school

- **Custody:** keeping pupils safe and secure (99.9%)
- **Behavioural rules:** instilling punctuality, obedience, respect for hierarchy (95%)
- **Cognitive development:** literacy, numeracy, test scores (?)
- **Socialisation:** internalisation of specific values towards civic life (?)
- **Screening and sorting:** reproduces (legitimately) socio-economic differences (95%)
Knowledge
- Traditional
  - Math
  - Language
  - etc.
- Modern
  - Robotics
  - Entrepreneurship
  - etc.

Skills
- Creativity
- Critical Thinking
- Communication
- Collaboration

Character
- Mindfulness
- Curiosity
- Courage
- Resilience
- Ethics
- Leadership

21st Century Education

Metacognition

© Center for Curriculum Redesign
Shift to pull means walking on two legs

How to pursue a “better future” - reframing human agency:
1. Closed – what we prepare for (contingent futures); what we attempt to create (plan for)
2. Open – what we discover, revealing what we did not know we knew (new sense making) and inventing the unknowable

Towards a capacity to distinguish search from choice and to be less biased towards path dependency – colonizing the future – end of history illusion.
“Society is now at a stage in history in which one pulse is ending and another beginning. The immense destruction that a new pulse signals is both frightening and creative. It raises fundamental questions about transformation. The only way to approach such a period, in which uncertainty is very large and one cannot predict what the future holds, is not to predict, but to experiment and act inventively and exuberantly via diverse adventures in living.”

C.S. “Buzz” Hollings, “Coping with Transformational Change”, Options, IIASA, Summer 2010
How we anticipate matters
It changes the present

Thank you | Riel Miller
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