Transformation of Education and Learning in the Knowledge-Intensive World

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“Natura Non Facit Saltus”

The Future is Full of Great Expectations

“Because everything in her home is waterproof, the housewife of 2000 can do her daily cleaning with a hose.”

“Miracles You'll See In The Next Fifty Years," Popular Mechanics, 1950

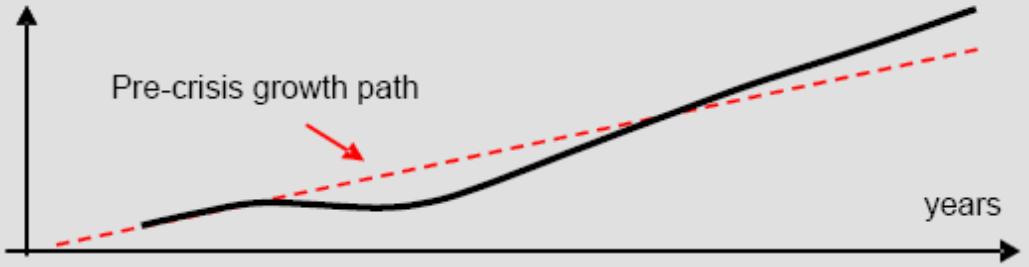
Imagine a World, 2025

- Where schools do not teach people to how to read and write
  - Where literacy is *so* 20th century
- Where teachers have taken research seriously and point out that:
  - Text is unnatural. Instead of speaking to someone, you have to write it ”down.”
  - We do not need to ship clay tables from one place to another anymore
  - Cultural transfer does not depend on your capability to recite big books.
  - You have to change your brain, permanently, to read and write. And
  - Up to 10 percent of people are dyslexic, anyway
- Education without literacy? Impossible.
- A ridiculous idea.
- No problem
- You just lack one of the 21st century skills. Creative imagination. Maybe you invested too much in literacy to give it up.
- To understand the future, and the potential of the present, it is important to understand what are our core assumptions; those that are so obvious that we don't stop & think

The Future As It Used To Be: EUROPE 2020

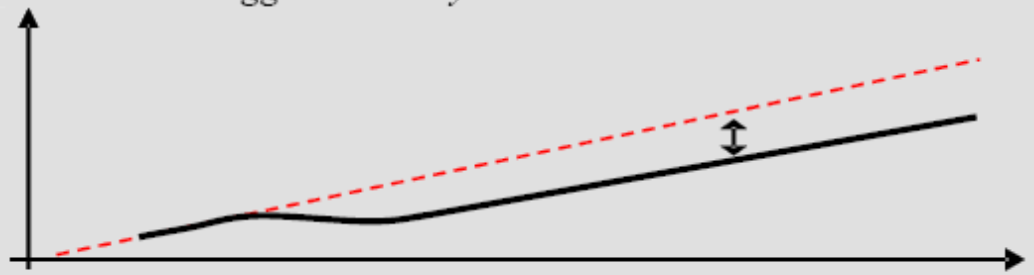
Three scenarios for Europe by 2020

Scenario 1: Sustainable recovery



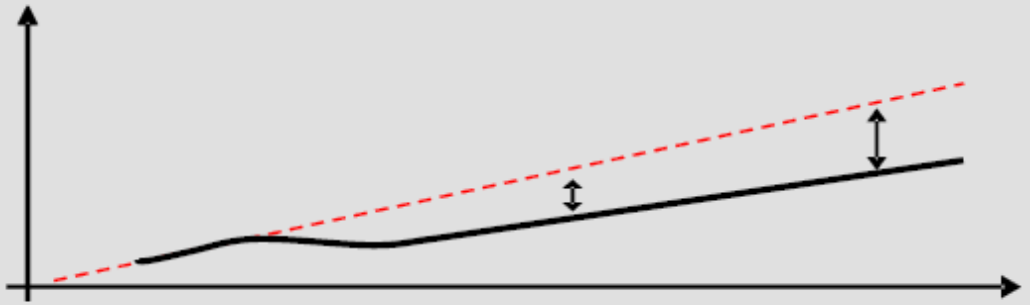
Europe is able to make a full return to earlier growth path and raise its potential to go beyond

Scenario 2: Sluggish recovery



Europe will have suffered a permanent loss in wealth and start growing again from this eroded basis

Scenario 3: Lost decade



Europe will have suffered a permanent loss in wealth and potential for future growth

COM(2010) 2020

The Problem With This...

- “Smart, sustainable and inclusive growth; this is the only way to guarantee increasing living standards of life.”

- ...Now we all nod. Indeed. Great challenges. The world at a turning point...
- But why there is no question mark? Is this the only way?
- Is Europe (the US, Korea, Japan, China...) trying to create new economic frontiers, or still trying to catch up with the 20th century frontier?
- Does this statement simply express lack of imagination?
  - There is always another way
  - Empirically, output level is loosely coupled with development, at best
  - Theoretically, there is no connection – unless output level is defined as development
  - Output levels, growth, and productivity are measured in a dismal way
    - the statistics are optimized for industrial mass production under the conditions of limited globalization
    - blind to collective costs and common goods
    - corrected for the most obvious errors by creating even bigger errors

Out of the Old Box

Important in the future.

Going up...

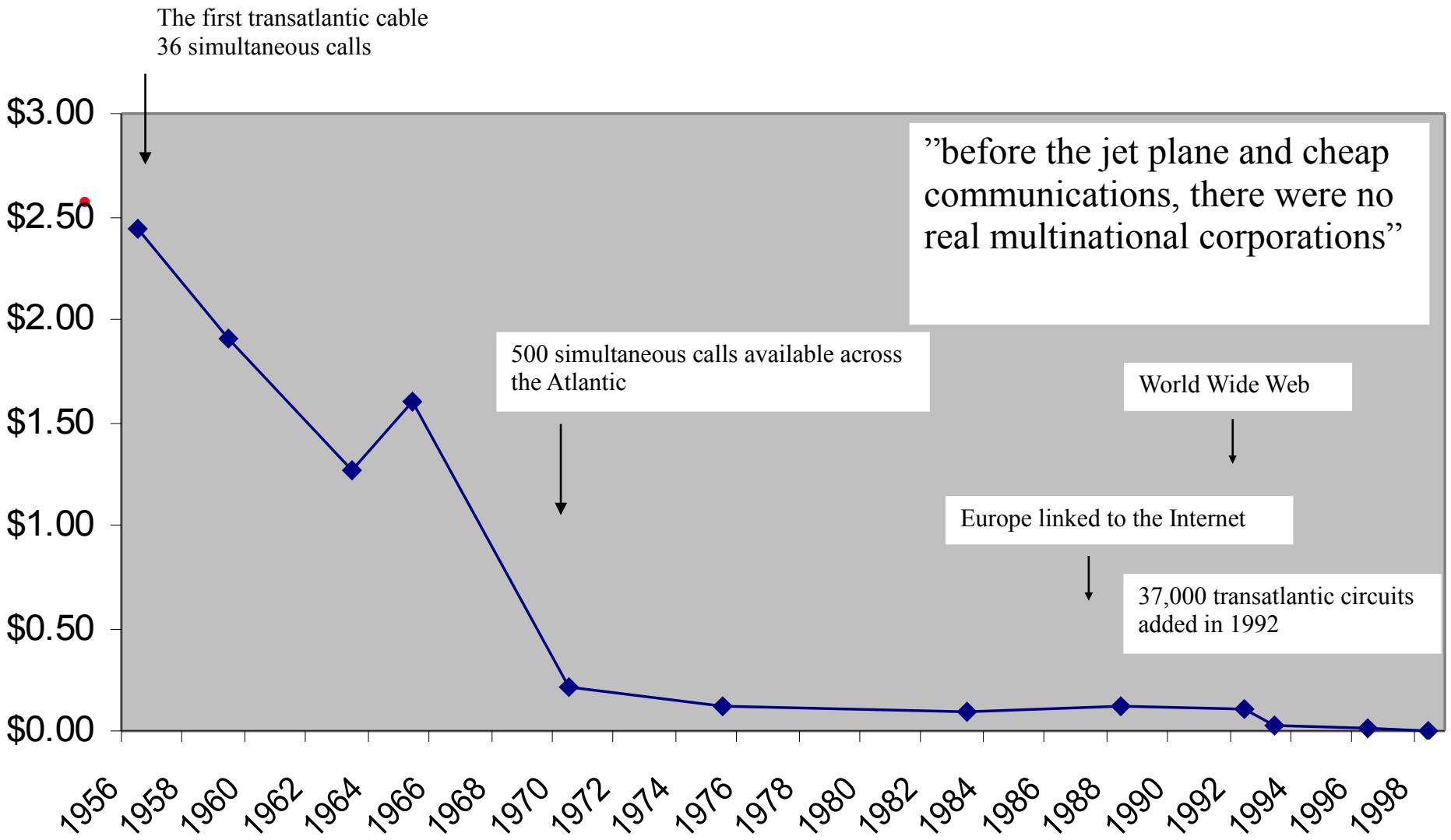
New forms of innovation
and value creation

Old forms of innovation
and value production

Still important.

Going down...

The Third Globalization



Investment cost of transatlantic cable per minute of use

Production in the 21st Century

- ICT has made a new type of globalization possible
- Products are increasingly modular and value-chains are fragmented
- In the new system of production, goods and services are created by dynamically configured and transient networks that emerge when production is needed
- These networks are increasingly automated and computer-based, and they operate in real-time
- Production networks are created in seconds, and they disappear as soon as the service is delivered
- In these networks, there is no space or time for human intervention
- If production can be automated, it has to automated
- This is the essence of the ”third globalization.” It is something that the humankind has never seen before. This is how the knowledge-based economy is different from the industrial model.
- White-collar workers don't have to worry about alienation; there will be no white-collar workers in the future.
- This means that a new paradigm for development and socio-economic progress is emerging. It is not based on global competitiveness, innovation, or growth.

The Productive Function of Education

- The current system of schooling emerged with a new mode of production, factory-based manufacturing, that created new areas of knowing and expertise. The home, the church, and the community lost their central role in education.
- Education was outsourced to specialized institutions, put in a classroom, and the door was closed.
  - “The supply of flour, of lumber, of foods, of building materials, of household furniture, even of metal ware, of nails, hinges, hammers, etc., was in the immediate neighborhood, in shops which were constantly open to inspection and often centers of neighborhood congregation. The entire industrial process stood revealed, from the production on the farm of raw materials, till the finished article was actually put to use.”

Dewey, J. (1900) The School and Society, p.23.

The Enculturation Function

- “Society not only continues to exist by transmission, by communication, but it may fairly be said to exist in transmission, in communication...
- Men live in a community in virtue of the things which they have in common; and communication is the way in which they come to possess things in common. What they must have in common in order to form a community or society are aims, beliefs, aspirations, knowledge – a common understanding – like-mindedness as the sociologists say. Such things cannot be passed physically from one to another, like bricks.”

Dewey, J. (1916) Democracy and Education: An Introduction to the Philosophy of Education, p. 5.

Implementing the 4 Functions of Education

Social function	Industrial Society	Knowledge Society
Stratification / simplification	Hierarchical	Networked / heterarchical / informational
Productivity	Specialized and mechanized work	Continuous learning, meaning processing, and knowledge creation
Enculturation	Unified national cultures	Cultural diversity, transient communities and networks
Personal development	Transgenerational progress, realization of latent individual potential through vocation and social role	Cognitive development, increasing capability to realize value and make choices

Tuomi, I. (2013) Open educational resources and the transformation of education. European Journal of Education, *in press.*

The New Dynamics of Socio-Economic Evolution

- Scenario: "**The New Paradigm**"
  - Assumes that a new mental framework emerges in the "economy of abundance."
  - The institutions of the past are being replaced by new ones.
  - The old systems do not collapse; they simply become less and less relevant in the everyday life.
  - Production is increasingly done by "swirling clouds of production."
  - Alternative economies exist in parallel.
  - Value creation is less about extracting it from land and manual labor; instead, value is created through value creation. Instead of the *environment*, value comes from the *invironment*.
  - Social and knowledge capital become the dominant forms of capital.
  - Collective choices are made outside the old institutions.

Conclusion

- Schools and education need to be understood as parts of a broader ecosystem of learning.
- At present, this ecosystem is radically changing. When *currently existing* ICTs fully penetrate economic, social and cultural systems, the learning system will be transformed.
- Schools and educational institutions will need to reconsider their functions in this new ecosystem of learning.
- It doesn't really matter whether you are in North or South, East or West; The emerging learning system is global. The productive function of education will address global needs and an emerging international division of labor, even when enculturation may have local and cultural specificities.
- ”Developing countries” and ”newly industrialized countries” exist only in a context of a dynamic and historical process a global specialization of work and production. Poverty alleviation and educational requirements in remote villages will to an important extent depend on social and economic changes that occur in the most economically developed countries. The practical problems differ, but their solutions can only be understood in a global context.

“An important consequence of this is that the global information and communication network will become a critical infrastructure for learning. We will outsource major parts of our memory to it. Our perception will greatly depend on it. We will use it to make sense of ourselves and the world. And, obviously, our communications will rely on it.

The most fundamental educational policies, therefore, will be about this infrastructure.”