

Integration of Technology into the Curriculum and the Impact on Resources (Dancing With the Devil?)

Fredric M. Litto

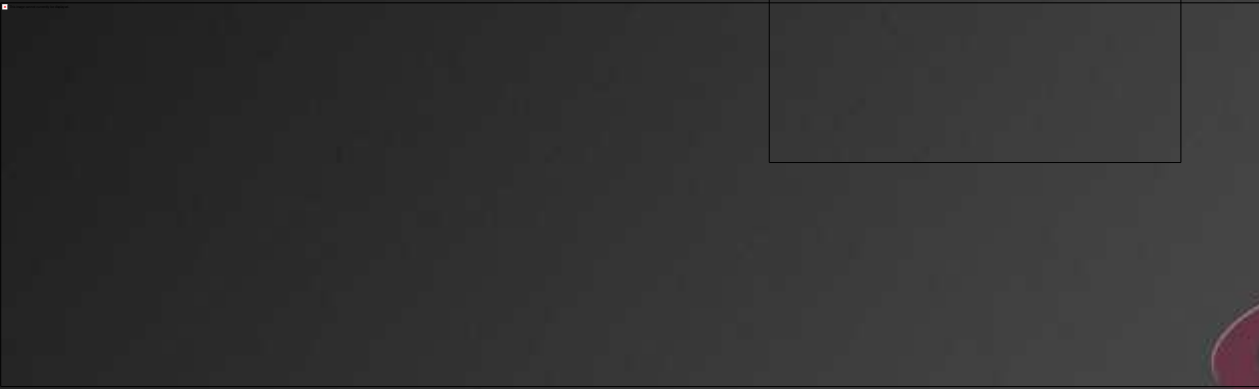
The University of São Paulo



What the Devil is Happening?



An elevator story with unintended
consequences



My Stanford Pos-Doc (1986-87)



- Videotexto/Viewdata/Minitel/Bildschirmtext
- Cognitive Sciences
- New Information and Communications Technologies

The School of the Future of the University of São Paulo

- Scaffolding – linking human and material resources
- Virtual Library of the Brazilian Student
- Virtual Learning Communities
- Virtual Communities of Practice

Our Mentors



The California Technology Project

Mihaly
Csikszentmihalyi

*Flow-the Psychology of
Optimal Experience* (1990)
*Creativity-Discovery and
Invention* (1996)

- Concentration
- Against multiprocessing

- Howard Gardner
Frames of Mind (1983)
*Multiple Intelligences-the
Theory in Practice* (1993)

- Linguistic
Logical/Mathematical
Spacial
Bodily-Kinesthetic
Musical
Interpersonal
Intrapersonal

- CD on Algebra based on MI

Robert Reich *The Work of Nations* (1992)



- Routine Production Services (25%)
 - A shrinking part of the workforce
- In-Person Services (30%)
 - A growing, largely feminine part
- Symbolic-Analytic Services (20%)
 - Problem-solvers (MDs, Engineers), knowledge workers, university trained, new and growing

Robert Reich *The Work of Nations* (Updated)



- New ways of looking at how people work now (2016)
- Automation is changing the major categories of work
- Machine-learning...algorithms...
- Cognitive work vs Non-Cognitive work
- Non-repetitious vs Repetitious work

New Thrusts

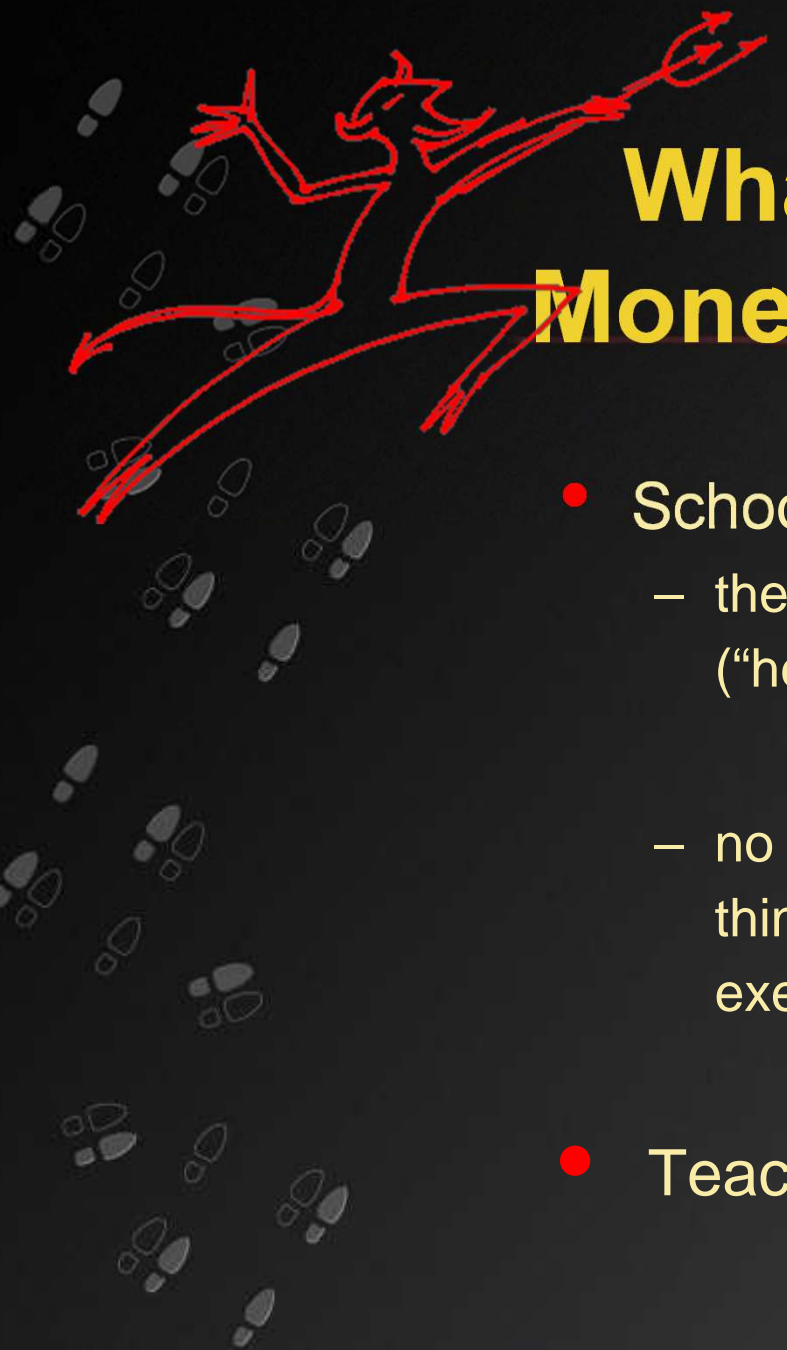


- Following other areas of society (genomic oriented medicine, custom-made automobiles):
- individual learning environments (virtual carrels)
- atomization of knowledge (to facilitate comprehension and reutilization): learning objects and open educational resources

Growth of Distance Learning



- Normally conceived of as having a course structure
- Type 1: Course-based (20 min.; 20 weeks; 20 months)
- Type 2: Using Internet2 permits serious learning: virtual/augmented reality environments; operation of scientific equip.
- Type 3: Access to virtual/digital libraries, museums, archives



What are the Non-Monetary Obstacles?

- Schools of Education in universities
 - they look more to the past than to the future (“heralds of retrogression”)
 - no courses for learning how to deal with/use thinking about the future (building scenarios, exercising the imagination)
- Teachers’ Unions

What Type of Personality is Attracted to Education?

- The rule-of-thumb:
 - 20% of teachers and professors are enthusiastic early-adopters
 - 20% are “doubting thomases,” resistant to change
 - 60% go with the wind; are influenced by local champions
- We need more research on this personality-attraction issue

On Memorization



- There is too much information coming at us
- A pluralistic society is not conducive to “canons”
- It can no longer be required
- The only thing worth memorizing today is the national poetry of one’s country of origin—a question of maintaining one’s identity

On Memorization



- “An education is what remains after one has forgotten all one learned in school” - Albert Einstein
- School gives you information and development. Later on you forget the information, but the development remains
- “5-Minute University” YouTube, Vimeo
- “Medieval Helpdesk” “



We Need New Approaches to Learning



- In the past, when education was more elitist, the young learned
 - how to learn
 - how to evaluate evidence
 - how to spot a fallacy

from reading, reading, reading
(indirectly)

Now, with the avalanche, they must have
special classes on thinking (direct)

Preparation for What?



- 50% of university graduates eventually abandon the professional field they prepared for, and take on 5 to 6 different fields before retiring
- Retraining these people represents an enormous market for information providers

What's the Lowest Common Denominator of Learning?

- How to identify problems
- How to ask the “right” questions concerning a problem
- How to find the information you need to solve the problem
- How to evaluate the evidence you've found
- How to draw just conclusions
- How to communicate your results clearly, orally and in writing

Competencies versus comprehension



- Both are important, in differing dosages
- They are transferable to other fields
- But.....competencies are “horizontal”, and not profound
- Comprehension is “vertical,” going deeply
- [See Carl Bereiter and Marlene Scardamalia, UToronto, on this subject]



And Learners Need Contact with their Cultural Environment

- The forty-hour work week will eventually be reduced because of increased automation
- What will workers and their families do with the new-found time on their hands?
- They need to have “appreciation in music” and other arts taught in school

Thanks for your patience



Fredric M. Litto

frmlitto@usp.br

[The Powerpoint “shell” used in this presentation was adapted from that created for Richard Katz’s 1998 talk at the Educause Conference, and for which I express thanks!]

