



Center for
**LifeLong
Learning
& Design**

University of Colorado at Boulder

**Wisdom is not the product of schooling
but the lifelong attempt to acquire it.
- Albert Einstein**

Making Learning a Part of Life
—
Beyond the “Gift Wrapping” Approach of Technology

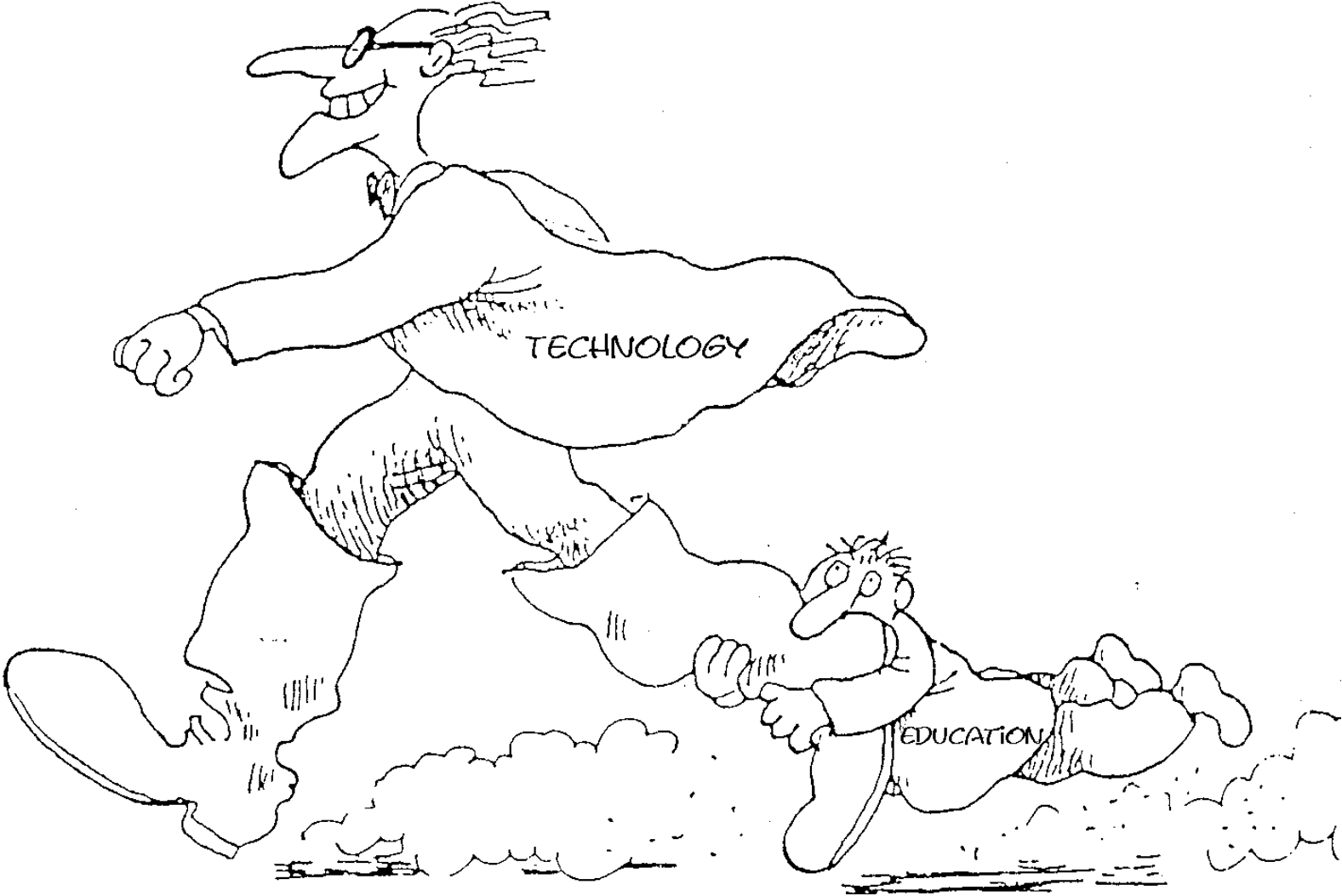
**Ernesto Arias & Gerhard Fischer
and
Andy Gorman, Rogerio de Paula & Eric Scharff**

ATLAS TAM Course, Spring 2000

State of the Art/Knowledge

- “gift wrapping” approach dominates information technologies approaches to Lifelong Learning
- “one cannot do philosophy with smoke signals” (Postman)
 - > current computer systems do not support creativity, imagination, contextualized learning, learning on demand, integration of working and learning
- claims: we (society, political decision makers, scientific community, universities) are not addressing
 - the potential magnitude of the change
 - the essential problems

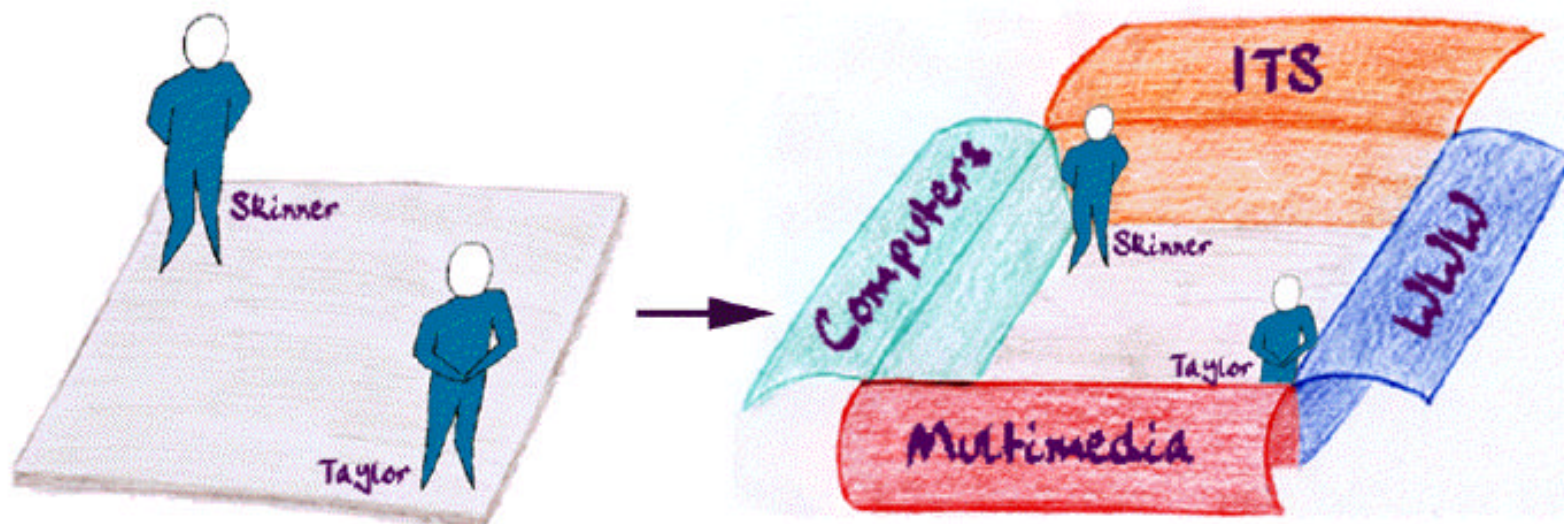
Education = f{Media, Technology} ← Media, Technology = f{Education}



Rethinking, Reinventing, and Redesigning Education

- **major argument driving current business reengineering efforts:** disappointing results from investments in information technology ---> technologies used to mechanize old ways of doing business
- **major argument for reinventing and redesigning education:** we use technology as an add-on to existing practices (“gift-wrapping”)---> instead of fundamentally rethinking what education should be about in the next century
- **claim:** “old” frameworks (such as instructionism, fixed curriculum, memorization, decontextualized learning,) do not get changed by technology itself (e.g., intelligent tutoring systems, multimedia, networks)
- **“new” frameworks:** lifelong learning, integration of working and learning, learning on demand, authentic problems, self-directed learning, (intrinsic) motivation, collaborative learning, organizational learning, new content

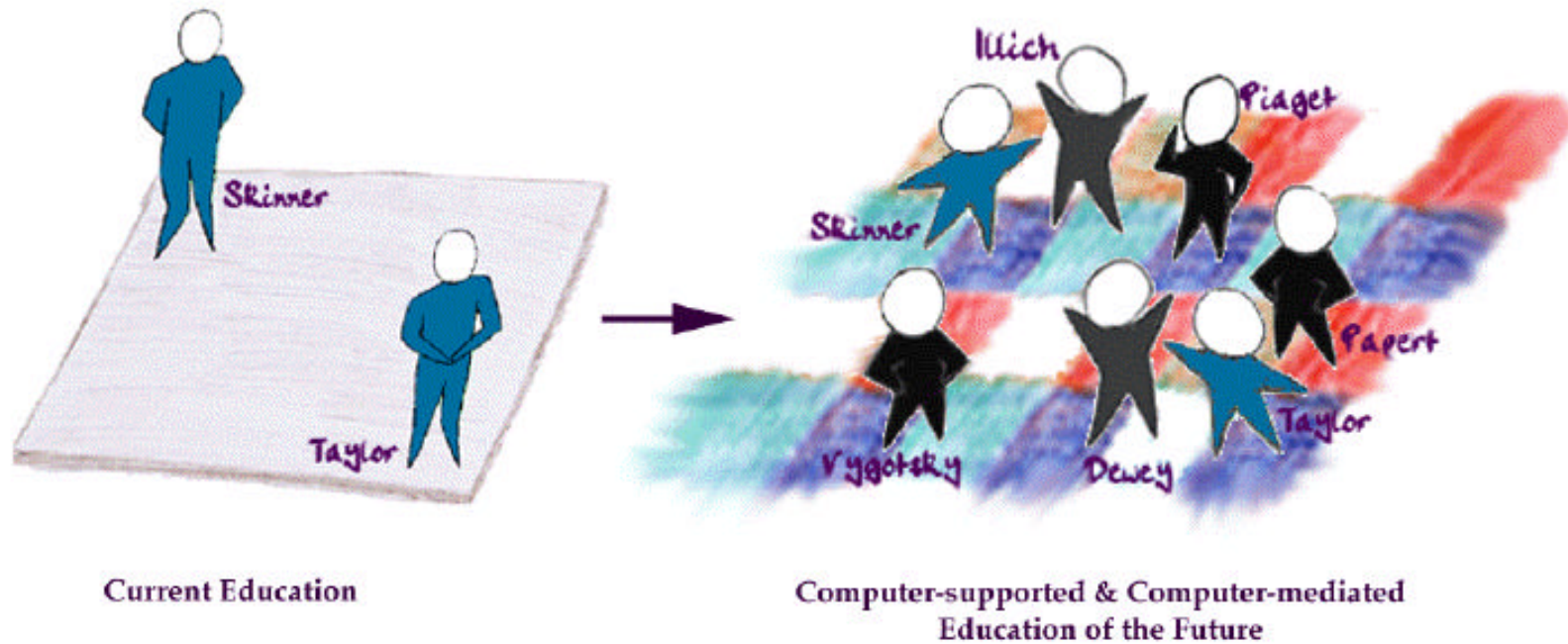
Adding Technology to Existing Educational Practice



Current Education

Current Education
wrapped in Technology

Rethinking, Reinventing and Reengineering Educational Theory and Educational Practice



Beyond Skinner and Taylor

Skinner / Taylor		Post - Skinner /Taylor
there is a “scientific,” best way to learn and to work	--->	problems are ill-defined and wicked
separation of thinking, doing, and learning	--->	integration
assumption: task domains can be completely understood	--->	partial understanding
all relevant knowledge can be explicitly articulated	--->	knowledge is tacit
teacher / manager as oracle	--->	teacher / manager as facilitator or coach
operational environment: mass markets, simple products and processes, slow change, certainty	--->	customer orientation, complex products and processes, rapid and substantial change, uncertainty and conflicts

Learning: Current Theories

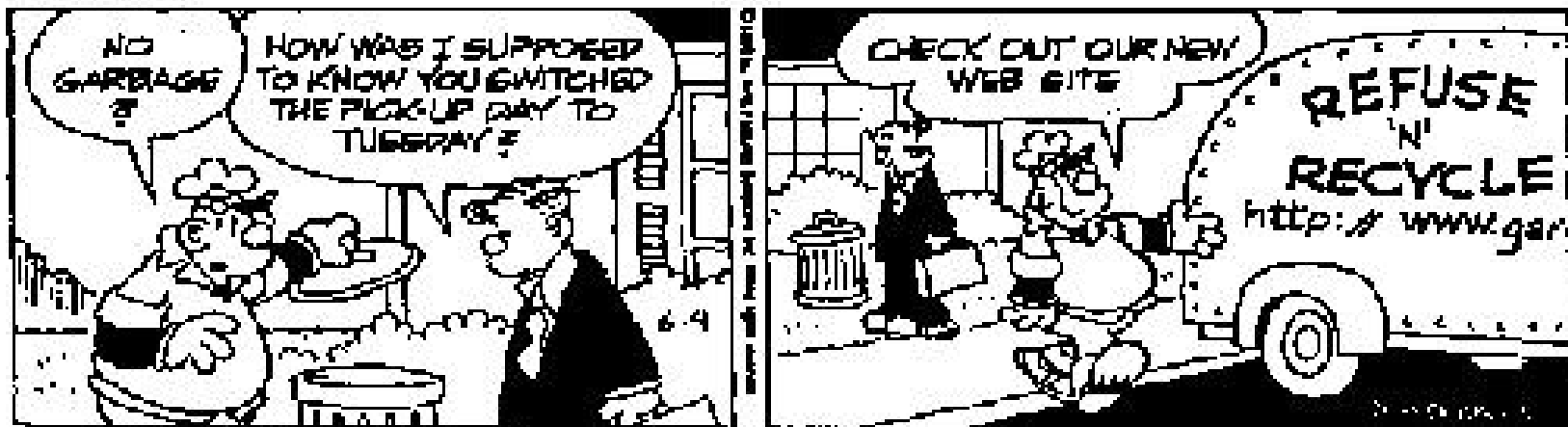
- learning is a process of **knowledge construction**, not of knowledge recording or absorption
- learning is **knowledge-dependent**; people use their existing knowledge to construct new knowledge
- learning is highly **tuned to the situation** in which it takes place
- learning needs to account for **distributed cognition** requiring to combine knowledge in the head with knowledge in the world
- learning is affected as much by **motivational issues** as by cognitive issues

Myths and Misconceptions

- computers by themselves will change education
- information is a scarce resource (the “Nobel Prize” winner myth)
- content / value / quality of information and knowledge is improved just because it is offered in multi-media or over the WWW
- “ease of use” is the greatest challenge or the most desirable goal (instead of low threshold and high ceiling, engagement, affection, personal relevance)
- the single or most important objective of computational media is
 - reduce the **cost** of education
 - increase the **quality**
 - we need to resolve the paradox between economical realities and educational objectives

Content / Value / Quality of Information

HI & LOIS



An Example: What's Wrong with Current Universities

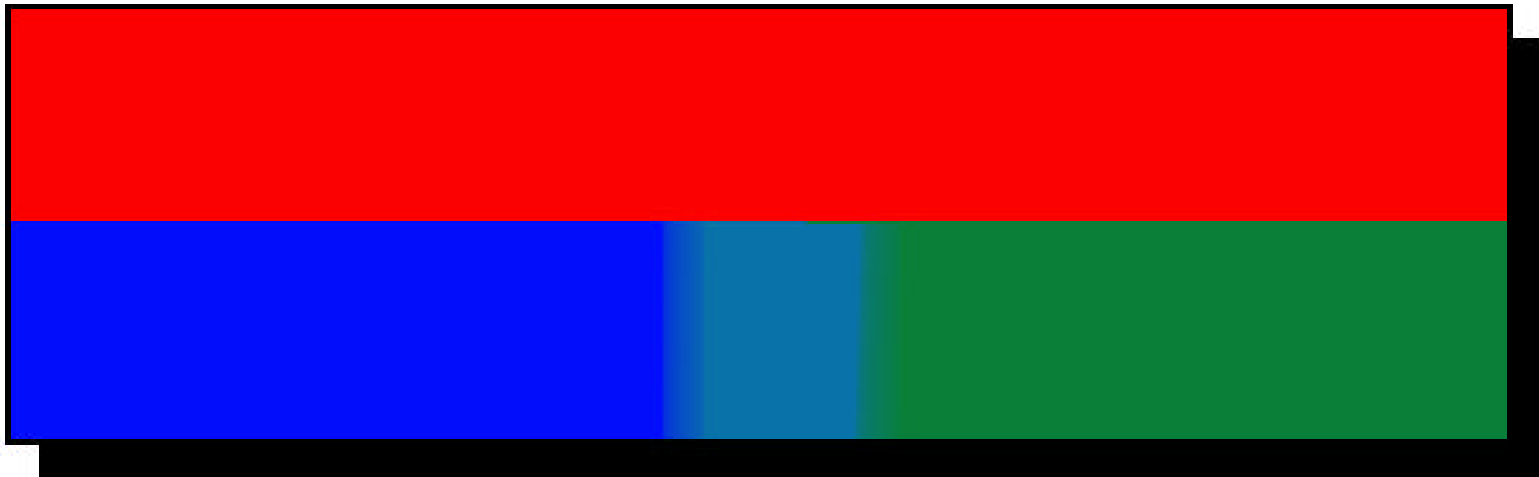
- **lecture dominated** — emphasizing passive knowledge absorption instead of active knowledge construction
- **curriculum dominated** — little room for authentic, self-directed learning activities
- students solve **given problems** (and do not learn to frame problems)
- problems have **right or wrong answers** (rather than being “wicked”)
- **closed book exams** — ignoring distributed cognition
- little emphasis on **collaborative learning and communication skills** (working together is regarded as “cheating”)

Challenges

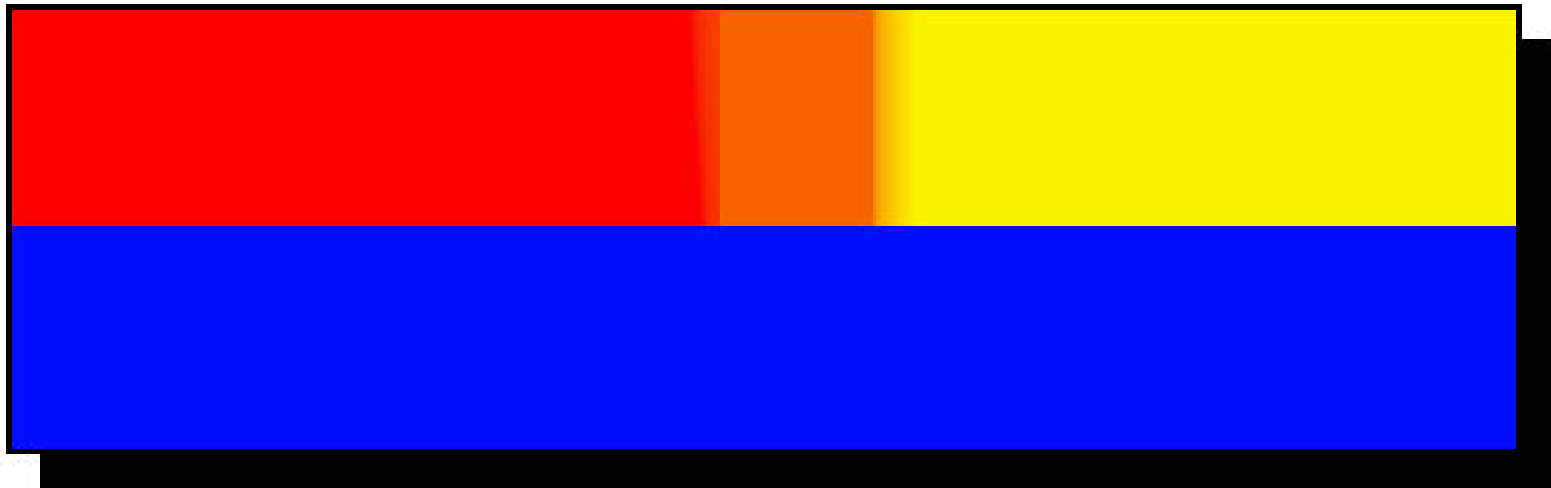
- **from consumer to designers**
 - 500 TV channel (the CHI'95 story)
 - Illich: “schools and universities = reproductive organ of a consumer society”
 - technical challenges: end-user computing, supporting virtual communities of practice
- **“basic” skills**
 - what is the critical background knowledge which makes learning on demand feasible?
 - question: if most job-relevant knowledge must be learned on demand what is the role of “basic” education?
 - question: do “basic skills” change their meaning under the influence of technology?
- **“school-to-work” transition:**
 - if the world of working and living relies on collaboration, creativity, definition and framing of problems, dealing with uncertainty, change, distributed cognition, symmetry of ignorance,
 - > then the world of schools and universities need to prepare students to function in this world

Beyond the Gift-Wrapping Approach

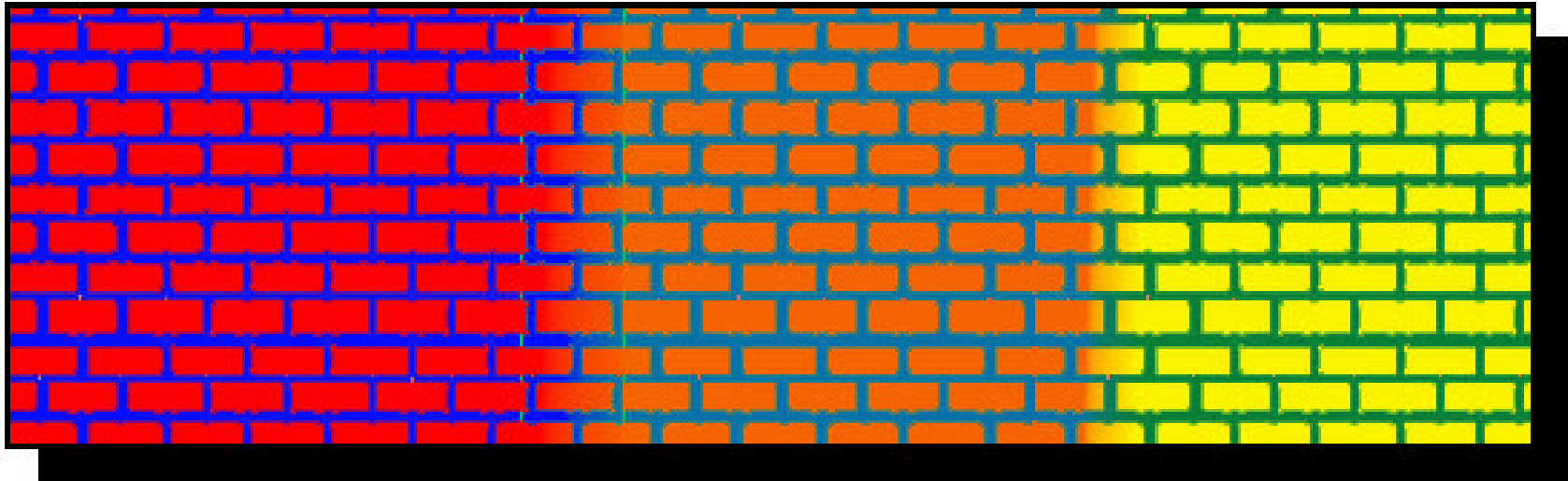
Model #1: **old content** is gift-wrapped in a new medium
example: “gift-wrapping” with **computational media**



Model #2: new content is delivered in the old medium
example: new math in the 1970's



Model #3: content & medium co-evolve together
(content = bricks; medium = mortar)



the big question: is the Internet “medium” or “message”?

Long-Term Societal Impact

- *“Wisdom is not the product of schooling but the lifelong attempt to acquire it.”*
(Einstein)
- redefining the roles of **“high-tech scribes”**
- explore the **fundamentally new possibilities and limitations** of computational media on how we think, create, work, learn, collaborate,
- **change of mindsets:**
 - breakdowns and symmetry of ignorance as opportunities
 - teachers not truth-tellers and oracles --> but coaches, facilitators, mentors, and learners
- **change of institutions:**
 - universities ---> have a dim future (most affected: lectures — least affected: contact intensive programs (see reading list))
 - companies need to become learning organizations