

E-learning – A troyan horse for change?

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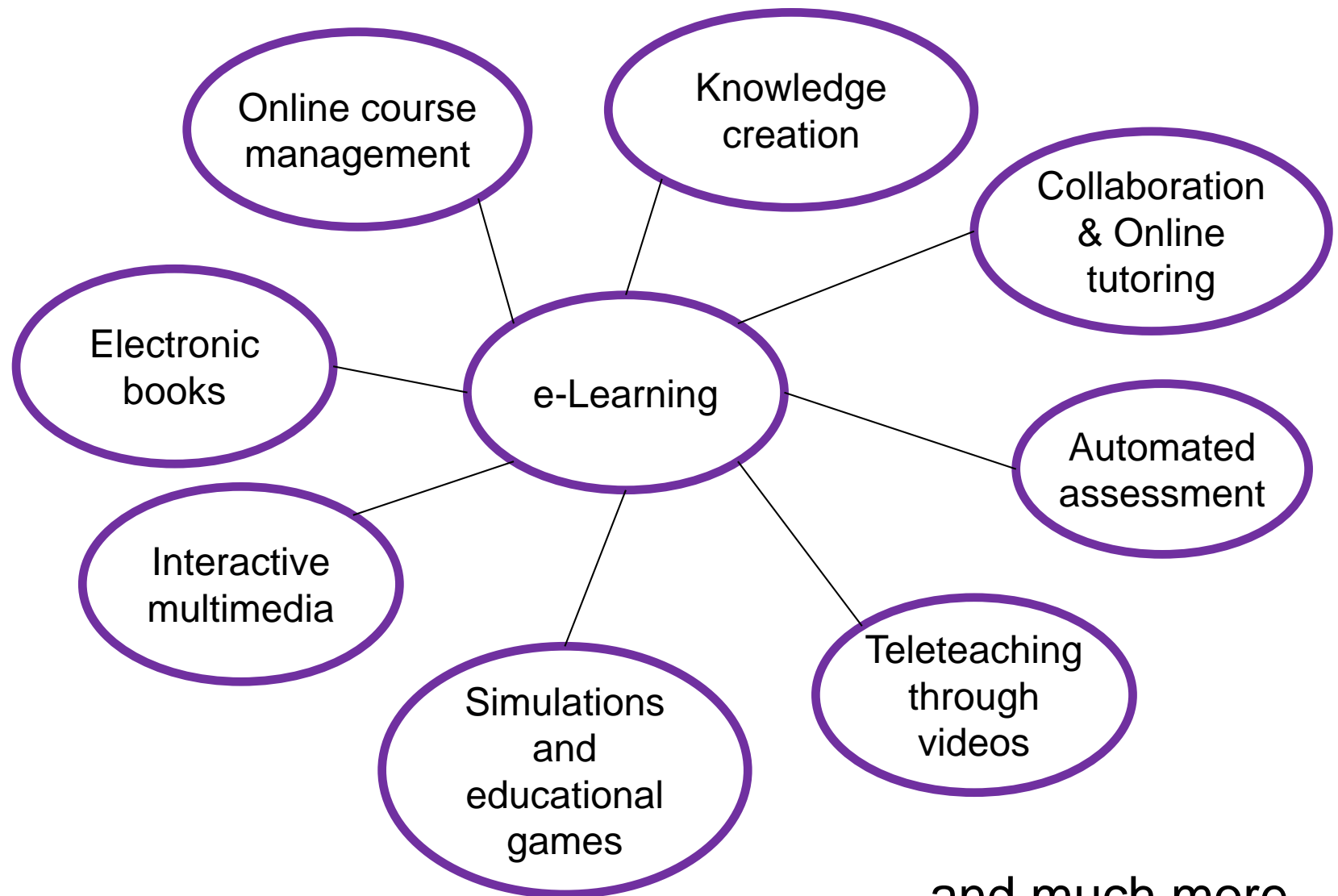
Ambassade de Suisse en Arménie



1.

What is
e-learning
?

E-learning includes:



... and much more

E-learning is:

Digital education

Technology-enhanced learning

ICT in education

Learning with technology

Instructional technology

Educational technology

Other words to
talk about the
same subject ...

Academic fields
of research &
study

E-learning is many things (again):

Cognitive tools for learning, computer-assisted language learning, computer-based assessment systems, computer-based training, computer-mediated communication, computer-supported collaborative learning, distributed learning environments, electronic performance support systems, interactive learning environments, interactive multimedia systems, interactive simulations and games, intelligent agents on the Internet, intelligent tutoring systems, microworlds, virtual reality based learning systems, MOOCs,

Dozens of educational strategies

Dozens of technologies

E-learning example #1:

After-school learning for kids:

- Self-paced
- Based on individual preferences

Within that flexible framework, kids can learn in four areas:

1. Computer animation
2. Game Development
3. Web Development
4. Digital Media

Where is this e-learning located ?

The design:

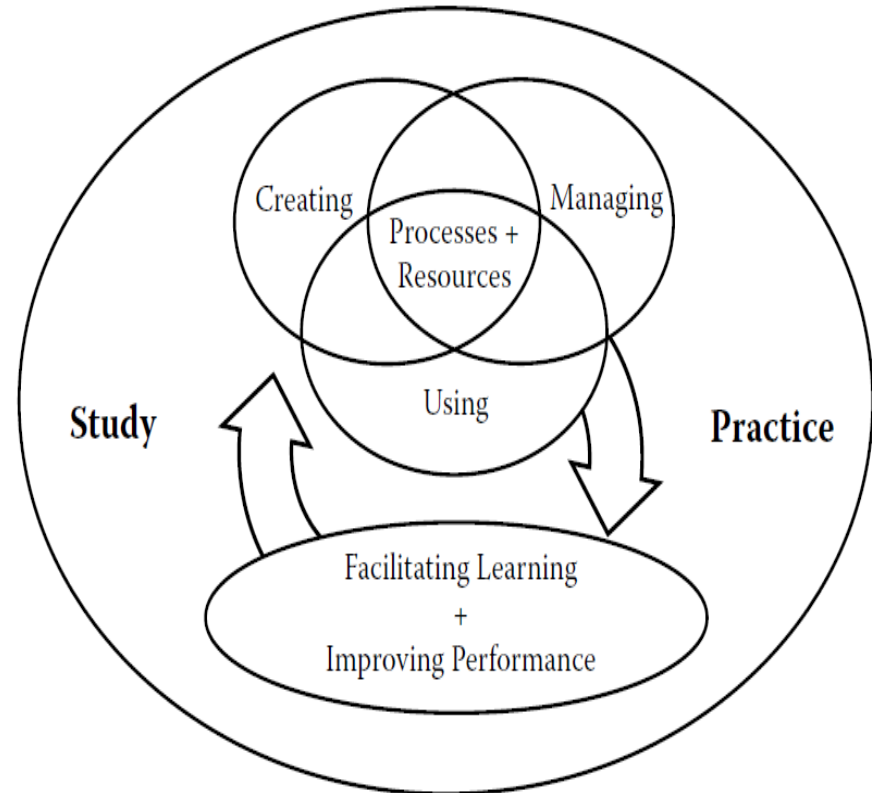
- Kids use **World, a virtual learning world**
- ... a virtual territory, where each kids's avatar **explores** a landscape of **learning**.
- Places hold **learning activities**.
- Each **personal learning trajectory** is illustrated with a visual evolving path.
- Kids also **interact with each other**, exchange notes, form teams, etc.
- Progress is like in games. , Members **collect skill units and gain access to new online activities and physical workshops**.

e-learning wants to improve education through technology

... and educational technologists are key actors ...

Educational technology is the **study** and ethical **practice** of **facilitating learning** and **improving performance** by **creating**, **using**, and **managing** appropriate **technological processes and resources**.

(Association for Educational Communications and Technology)



E-learning example #2:



FONDATION HUMANITAIRE SUISSE KASA
S'ENGAGE POUR UN DÉVELOPPEMENT DURABLE EN ARMÉNIE

Offered by: KASA Foundation

Target population: people who want to be a guide in the tourism sector.

Modules: 19

Workload: 7-9 hours/week (online/offline)

Duration: 6 months

Language: Armenian

Certification: Issued by KASA

Price: 20.000 AMD monthly

Learners:

- Study online materials, including multimedia
- Exchange in forums
- Complete practical assignments
- Do online quizzes
- Participate in some face to face meetings and visits

There **is** change:

- **More learning
outside school**

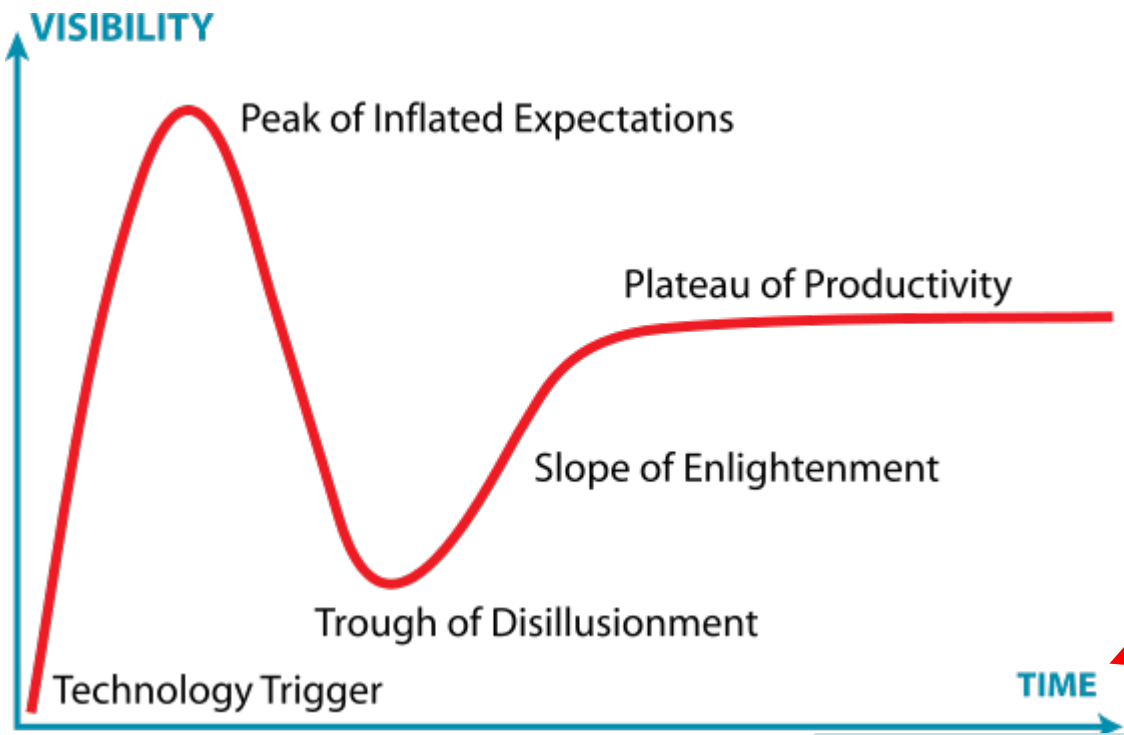
Now, is there
pedagogical change
in formal education ?

2 ■

The role &
evolution of
technology

E-learning = A history of (mostly) aborted hype cycles

The **Hype Cycle** is a branded graphical tool by [Gartner Consulting](http://www.gartner.com) for representing the maturity, adoption and social application of specific technologies.

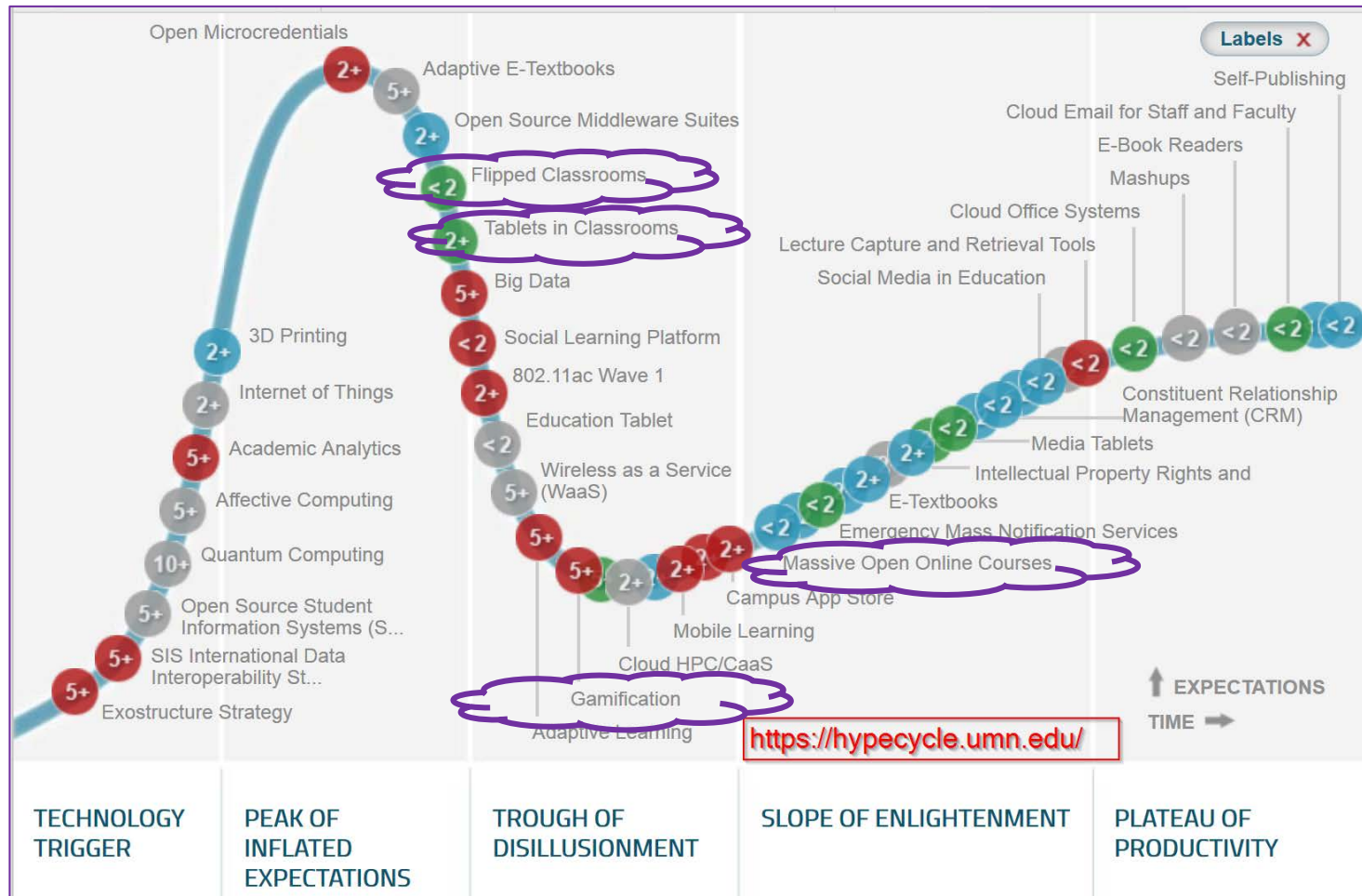


2 - 25 years

http://en.wikipedia.org/wiki/Hype_cycle

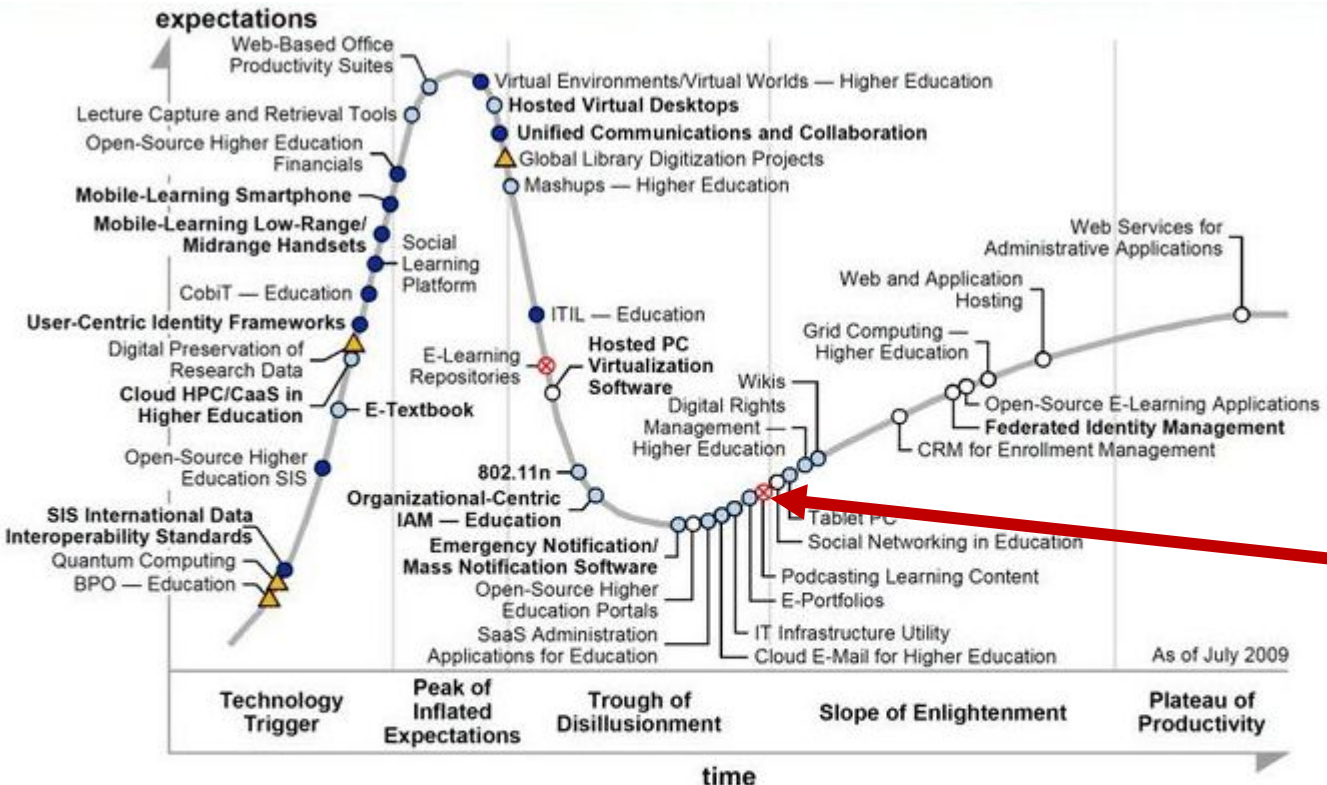
Technology, not pedagogy, triggers new cycles

The technology hype cycle in education (2014)



Interactive tool: <https://hypecycle.umn.edu/>

It is difficult to predict the future



Years to mainstream adoption:
 ○ less than 2 years ○ 2 to 5 years ● 5 to 10 years ▲ more than 10 years ⊗ obsolete before plateau

- **Off the Hype Cycle**
 - Personally Owned Devices with network access
 - RFID Library Materials
 - IP-video for e-learning

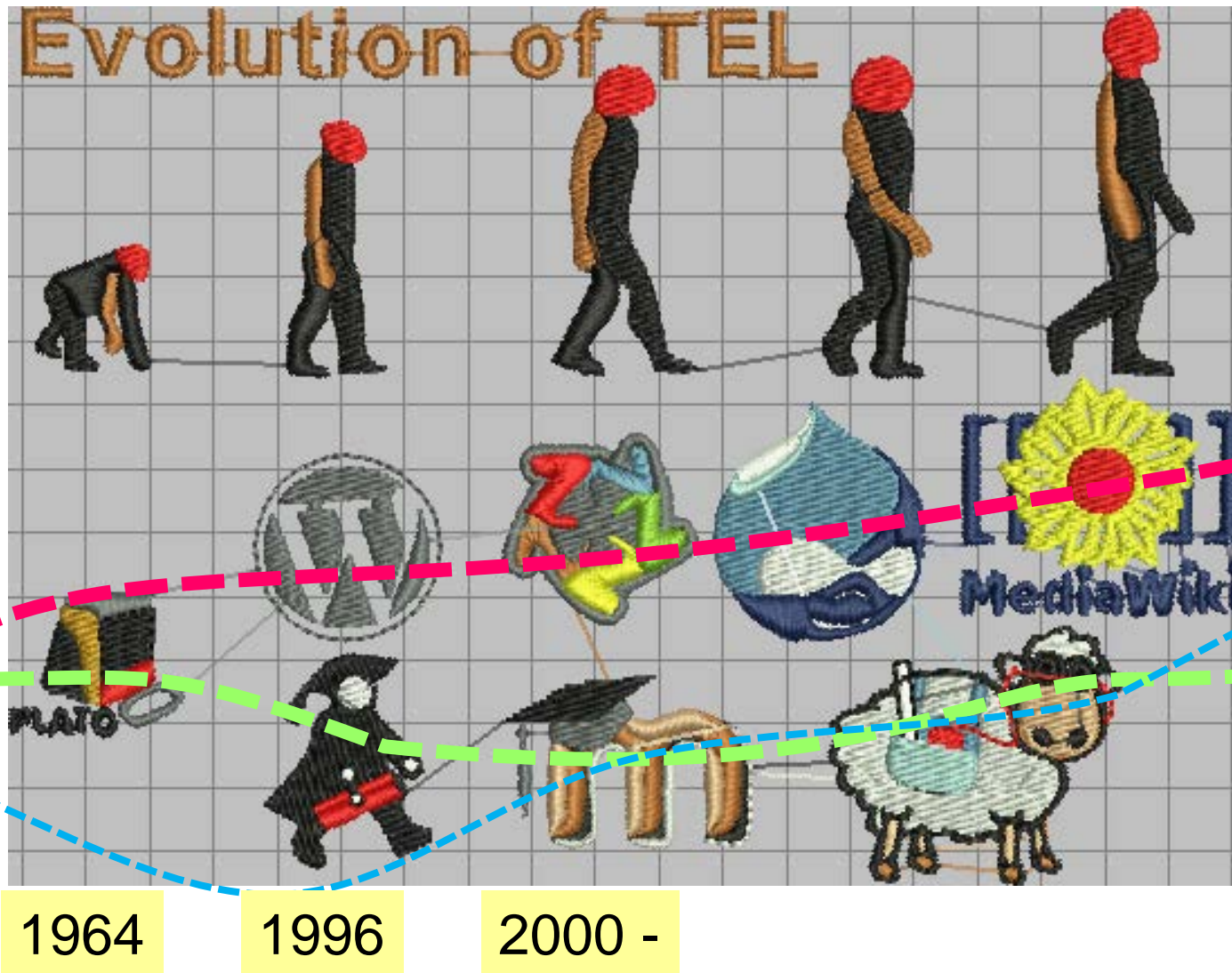
2009:
 • Gartner's education hype cycle:
Educational TV is dead

But in 2014:
Podcasts are central in (x)MOOCs !



Evolution of the e-learning infrastructure

Avoid catching up with the latest hype: Invest time in instructional design and understanding past achievements

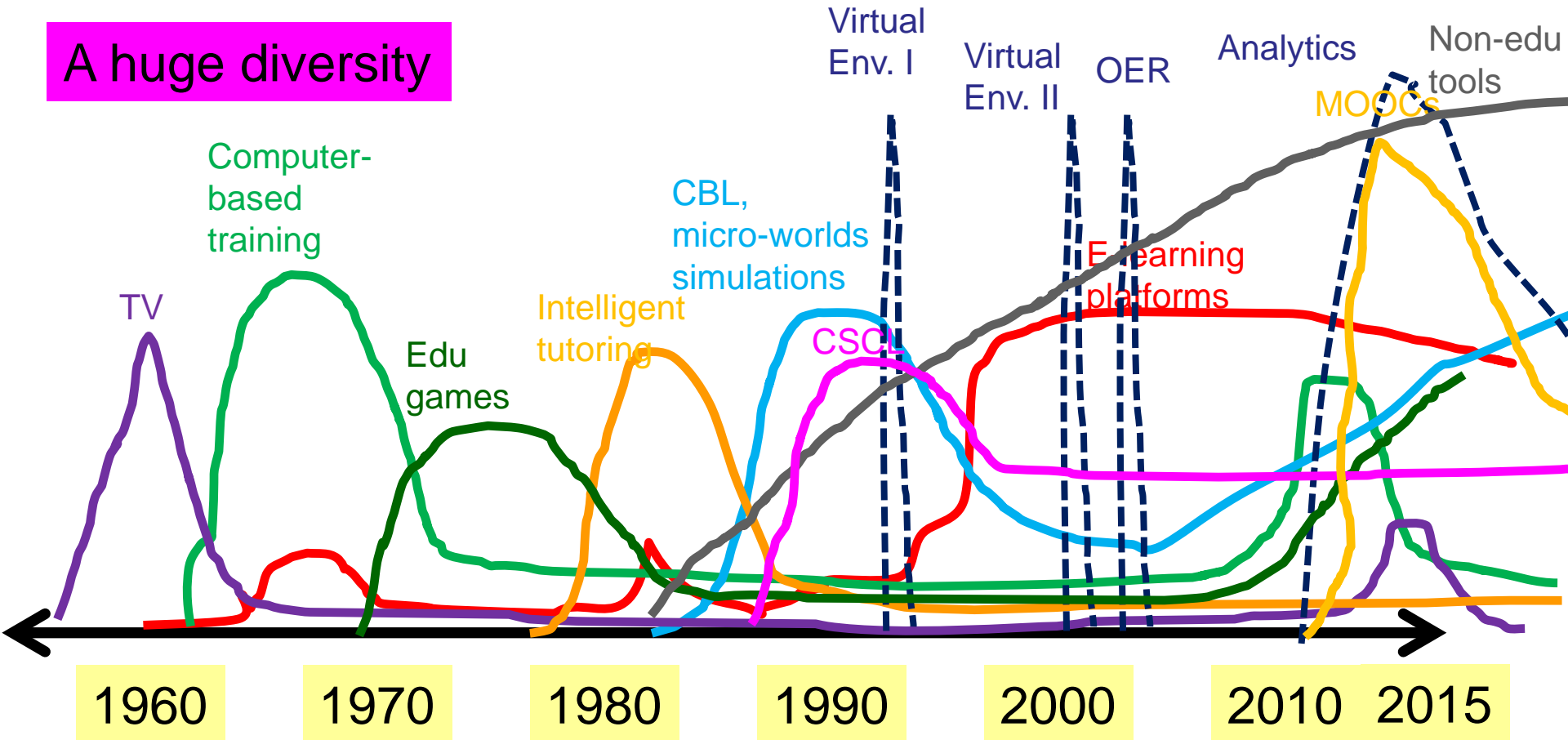


E-learning - A slow history of innovation & change

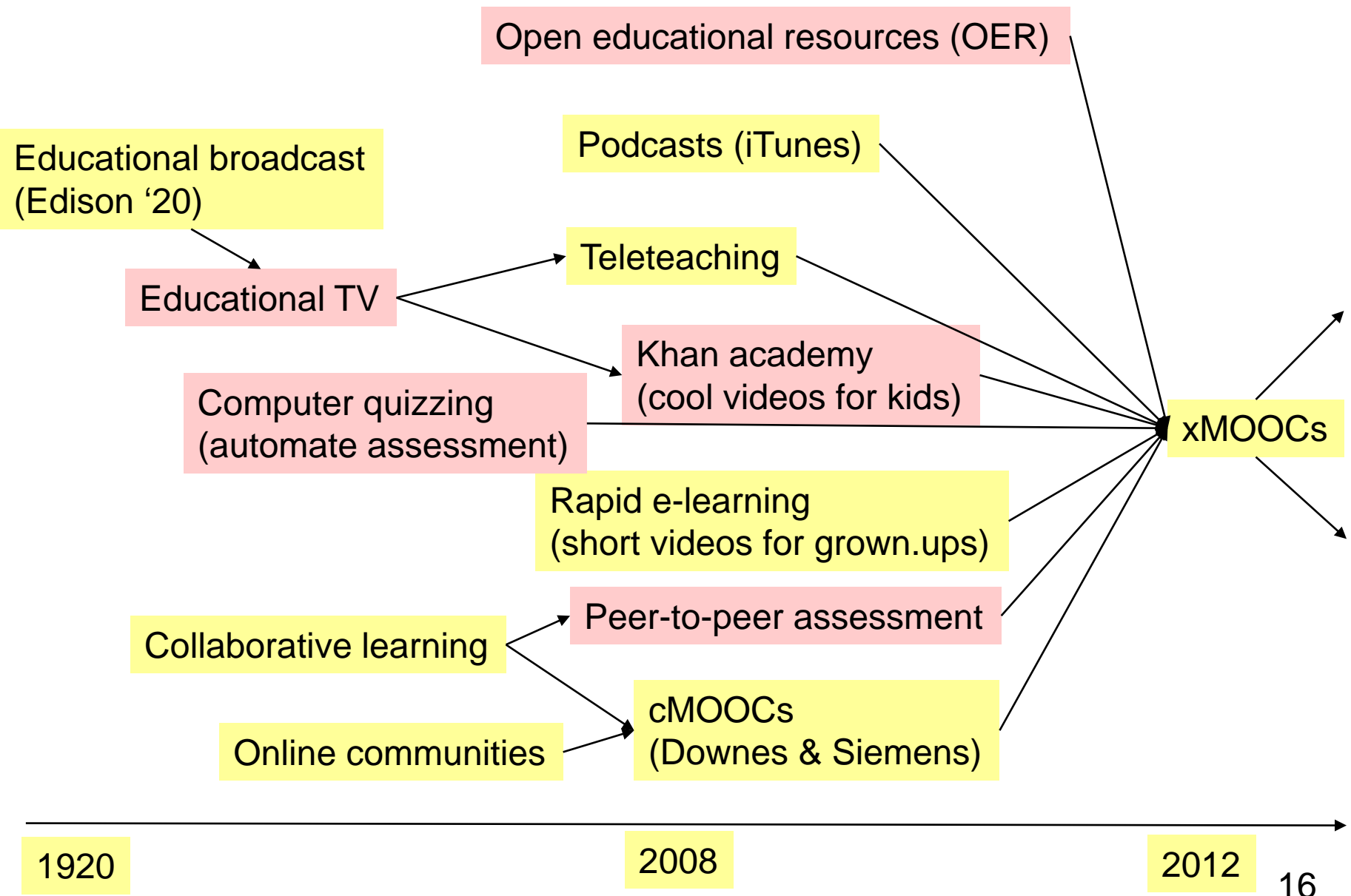
«Big inventions» about every 10 years

- New administrative structures are created, no communication
- New people enter the game, no understanding of basic principles

A huge diversity



Change is usually very slow, sometimes it appears to be fast
The xMOOCs «tsunami» bundles other stuff...



3.

What is
education ?

First principles: what is good education ?

Connect & apply

1. The demonstration principle

- Learning is promoted when learners **observe a demonstration**

2. The application principle

- Learning is promoted when learners **apply the new knowledge**

3. The activation principle

- Learning is promoted when learners **activate prior knowledge** or experience

4. The integration principle:

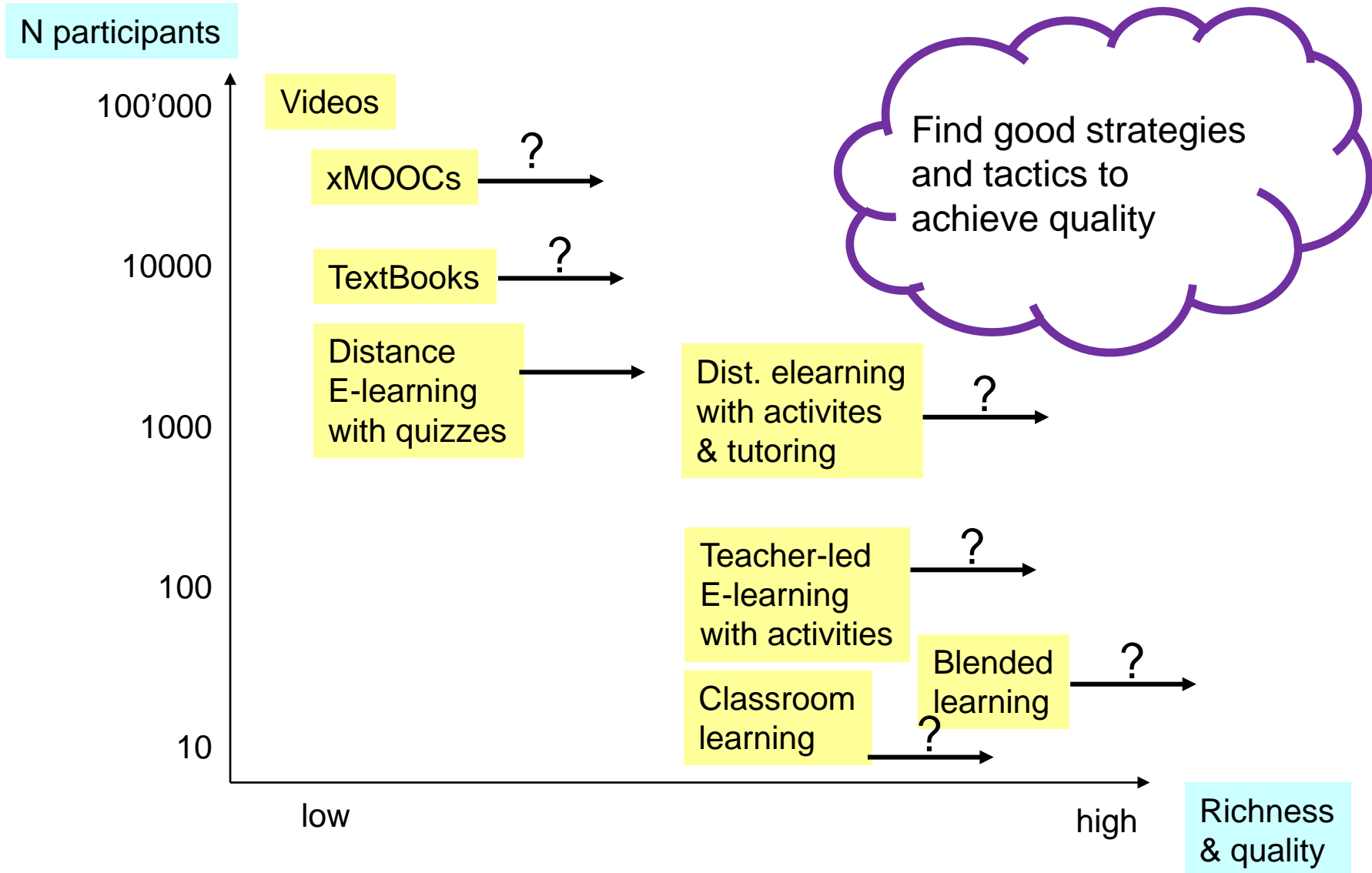
- Learning is promoted when learners **integrate** their new knowledge into their **everyday world**

5. The task-centered principle

- Learning is promoted when learners **engage in tasks** that lead to something

<http://mdavidmerrill.com/Papers/firstprinciplesbymerrill.pdf>

The e-learning challenge



Invest in instructional design:

- Strategies
- Tactics

Think

Discuss

Create learning scenarios

(evaluate and redesign)

- Respect diversity (both educational & cultural)

Strategies and technology must fit learning types and goals

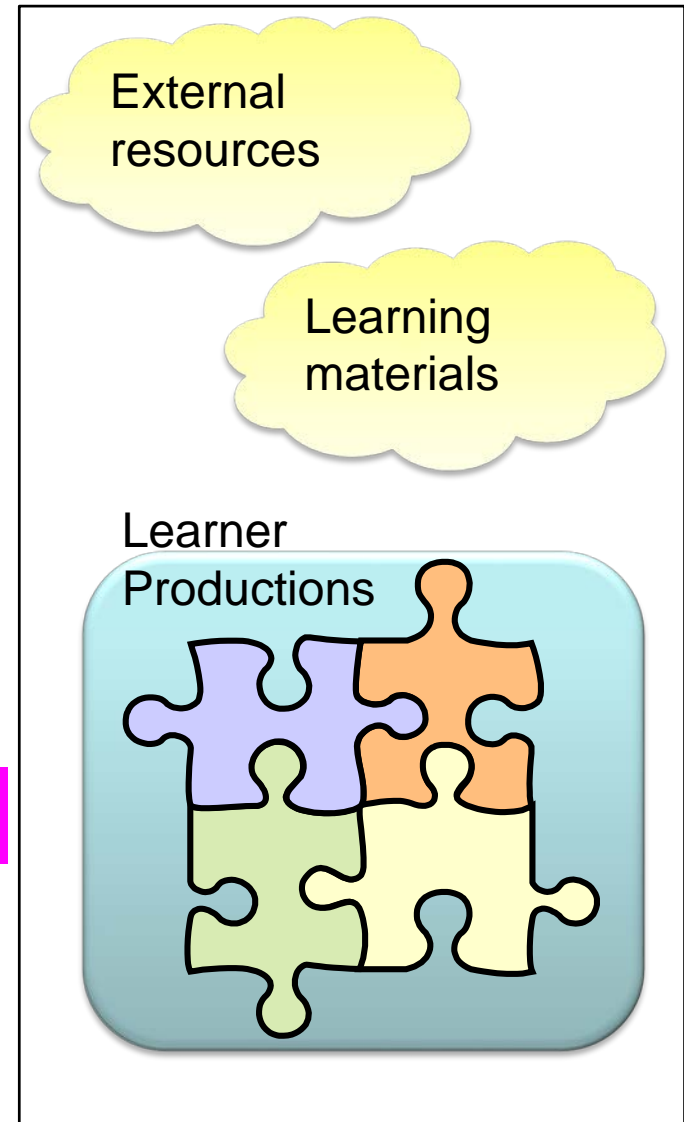
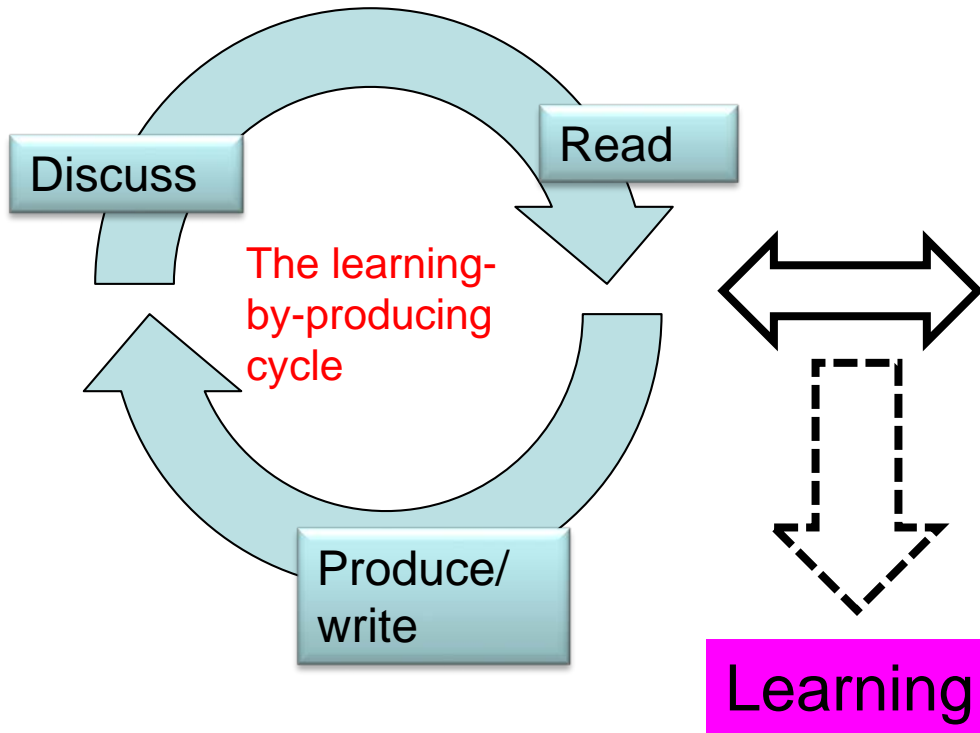
	Learning types ↔	Ex. strategies ↔	Ex. technologies
I: know that	I-a Facts : recall, description, identification, etc.	Direct instruction, programmed instruction, mastery learning	Presentation of contents (texts, pictures, diagrams, multimedia animations) on various technical supports.
	I-b Concepts : discrimination, categorization, discussion, etc.	Discovery learning, exploratory learning	The computer as a library, Writing/drawing software
II: know how	II-a Reasoning and procedures : inferences, deductions, etc. + procedure application	Simulation, virtual laboratory, problems to solve	Various kinds of interaction that include quizzing software, CBT, Simulations, microworlds etc.
	II-b Problem solving and production strategies: sub goaling + application of heuristics/methods	Case-based, inquiry-based, problem based learning	Various computer-mediated communication (CMC) tools such as email, forums, audio/video conferences, virtual environments, etc.
III: knowing in action	III Situated action : strategies in complex and authentic situations	project-based learning	Social software, portalware, Word processors, CAD systems, simulation software, laboratory software, etc.
IV: Other	IV Other: e.g. motivation, emotion, reflection	ARCS, learning portfolios	Tools that favor presence and reflection.

Example: A strategy for facts and simple procedure learning

9 events of instruction (Gagné)

1. **Gain attention** (ground the lesson, motivate)
 - Present a good problem, a new situation, use a multimedia advertisement, ask questions...
2. **Describe the goal** (frame the information, create expectancies)
 - State what will be accomplished, how knowledge can be used, give a demonstration,...
3. **Stimulate recall** of prior knowledge (help connecting)
 - ... facts, rules, procedures or skills relevant to the current lesson
4. **Present** the material to be learned
 - e.g. text, graphics, simulations, figures, pictures, sound, etc. Chunk information
5. **Provide guidance** for learning
 - Presentation of content is different from instructions on how to learn. Use of different channel (e.g. side-boxes)
6. **Elicit** performance "**practice**"
 - Let the learner do something with the knowledge, practice skills or apply knowledge. At least use MCQ's.
7. **Provide informative feedback** ,
 - show correctness of the trainee's response, analyze learner's behavior, maybe present a good (step-by-step) solution of the problem
8. **Assess** performance, test if the lesson has been learned.
 - Also provide general progress information
9. **Enhance** retention and **transfer** :
 - e.g. inform the learner about similar problem situations, provide additional practice. Put the learner in a transfer situation...

Example: Project-oriented learning → principles

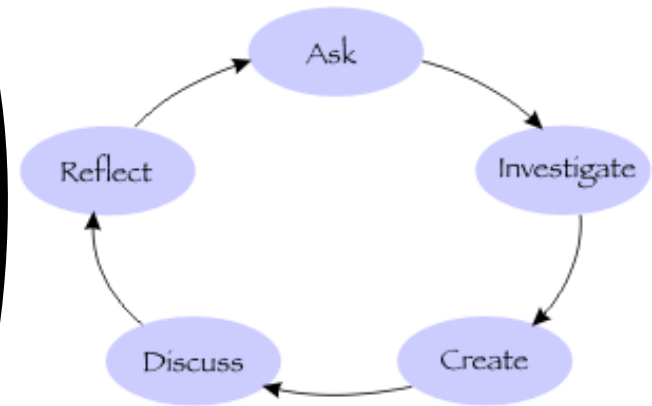


Includes:
[inquiry-based learning](#) (IBL)
[problem-based learning](#) (PrBL)
[project-based learning](#) (PBL)
[project-methodology-based learning](#)
[case-based learning](#) (CBL)

.....

Ex.: Inquiry Based Learning design

- Elicit questions
- Experiment, observe, read.
- Compose Q & A
- Present / Discuss
- Reframe

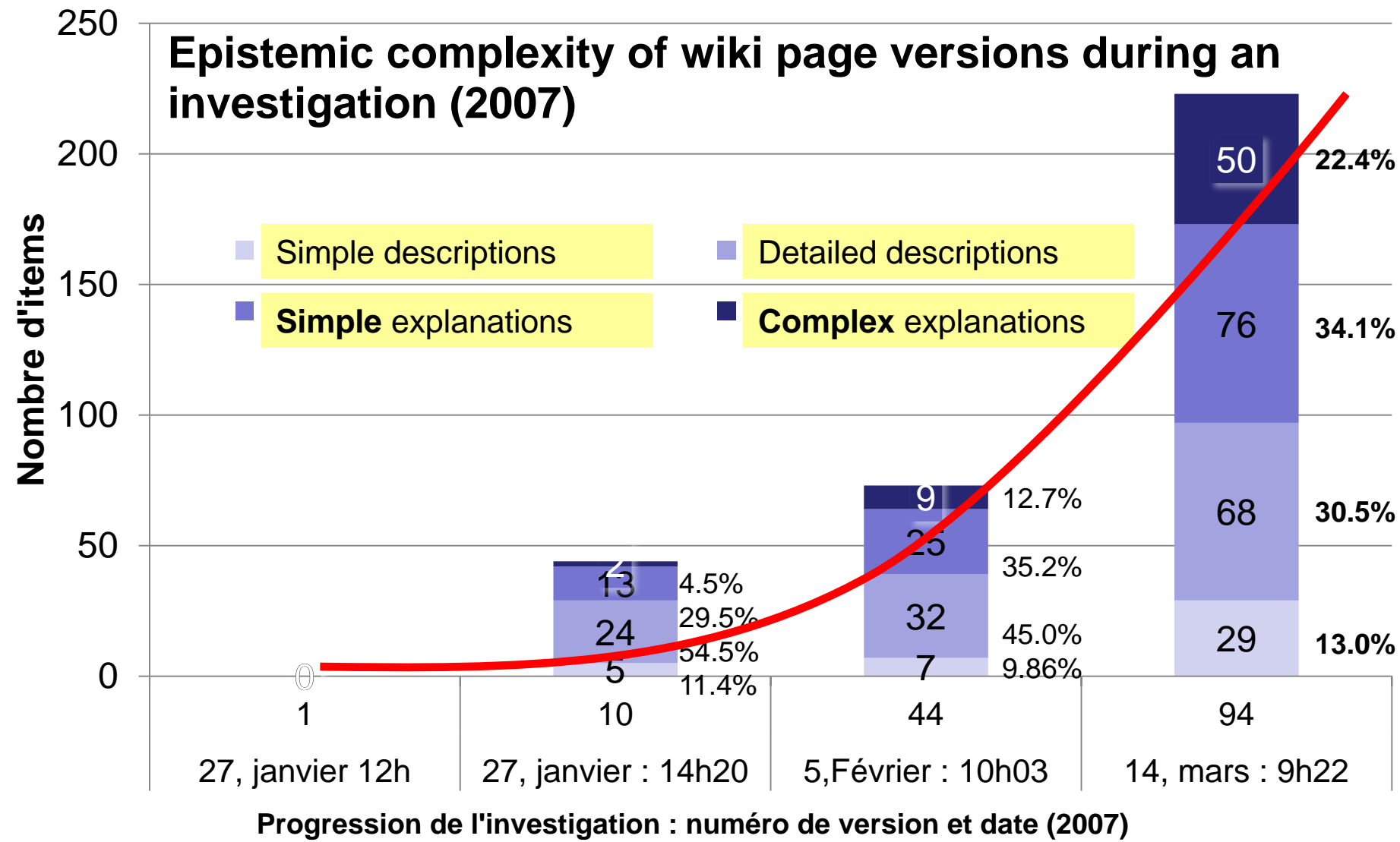


The crucial difference between current formulations of inquiry and the traditional "scientific method" is the explicit recognition that inquiry is cyclic and nonlinear.»

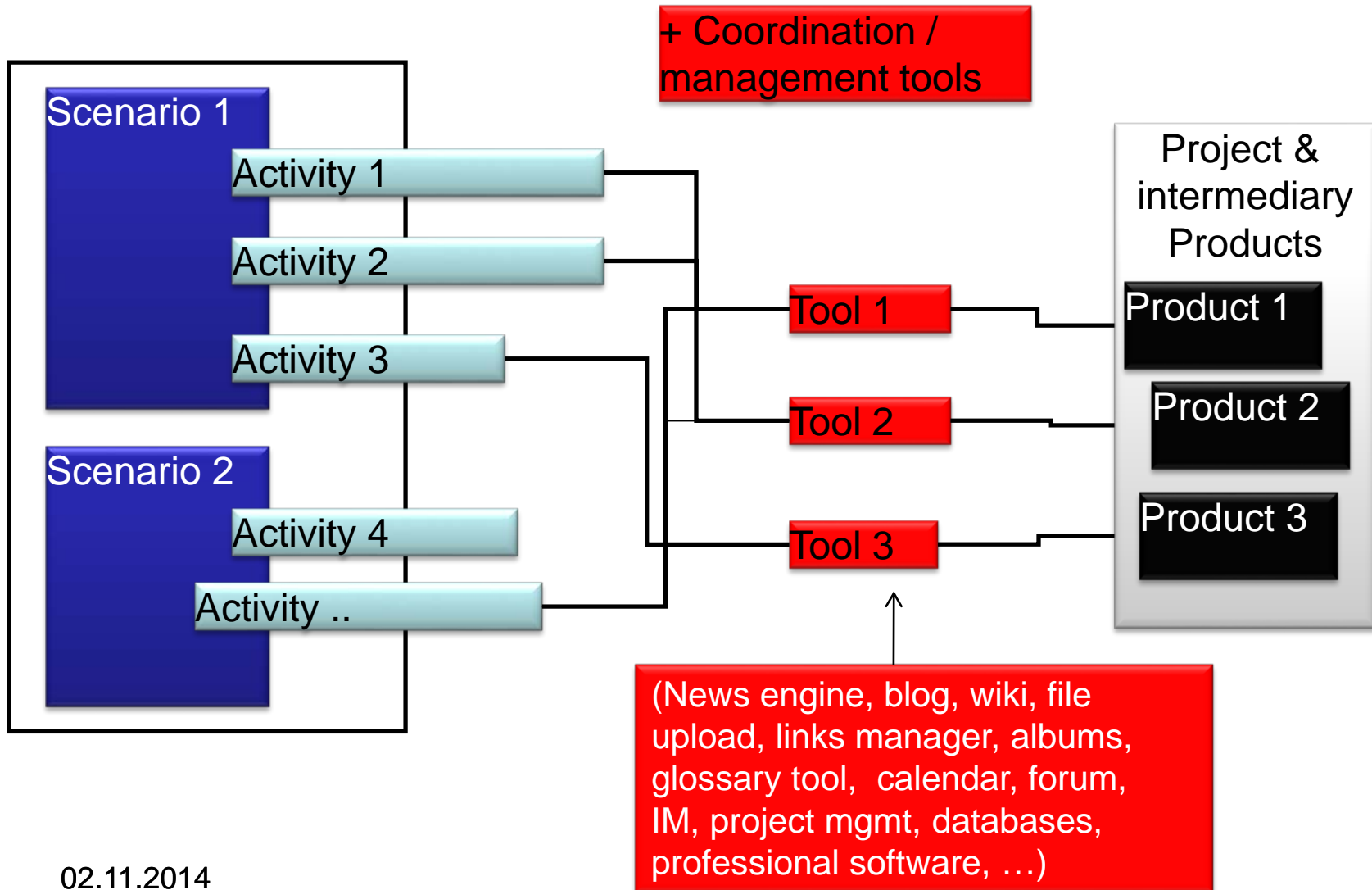
■ Sandoval 2004p. 216

Some strategies take time- Inquiry-based learning (Lombard, 2012)

It takes about 3 month before there is some deep learning !!



Activities are supported by tools and should lead to “products”



Good e-learning:

..... uses an appropriate pedagogical **strategy** aligned with goals, means and other constraints
..... creates **active** learning and **active** learners

Good e-learning technology:

Supports planned (and unplanned) **tactics**
with appropriate tools

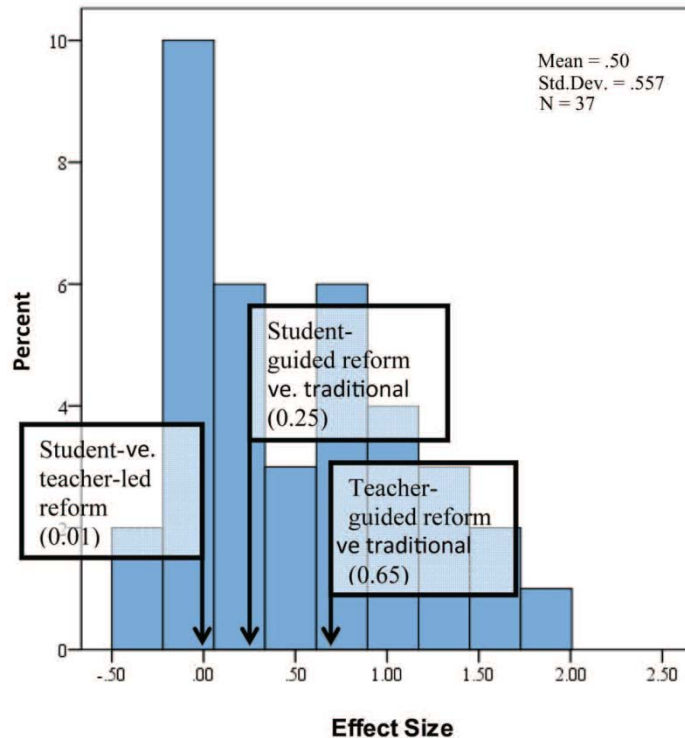
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Do we
have good
data about
educational
strategies ?

Meta studies

(studies about studies)



Experimental and Quasi-Experimental Studies of Inquiry-Based Science Teaching : A Meta-Analysis, (Furtak et al. 2002): **Teacher-guided inquiry works better than “open inquiry” or “traditional” pedagogy**

In a review of literature, we identified 300+ articles whose descriptions related to video games and academic achievement. We found **some evidence for the effects of video games on language learning, history, and physical education** (specifically exergames), but **little support for the academic value of video games in science and math.** (Young et al., 2012)

After a half-century of advocacy associated with instruction using minimal guidance, it appears that there is no body of research supporting the technique. In so far as there is any evidence from controlled studies, it almost **uniformly supports direct, strong instructional guidance rather than constructivist-based minimal guidance** during the instruction of novice to intermediate learners. (Literature review, Kirschner et al., 2006)

Interesting, but meta studies do not control all variables ... 30

The bottom line from many meta studies:

Learners need guidance

Ambitious strategies require “scripting”

Learners need (formal) challenge

Quality is more important than type of design

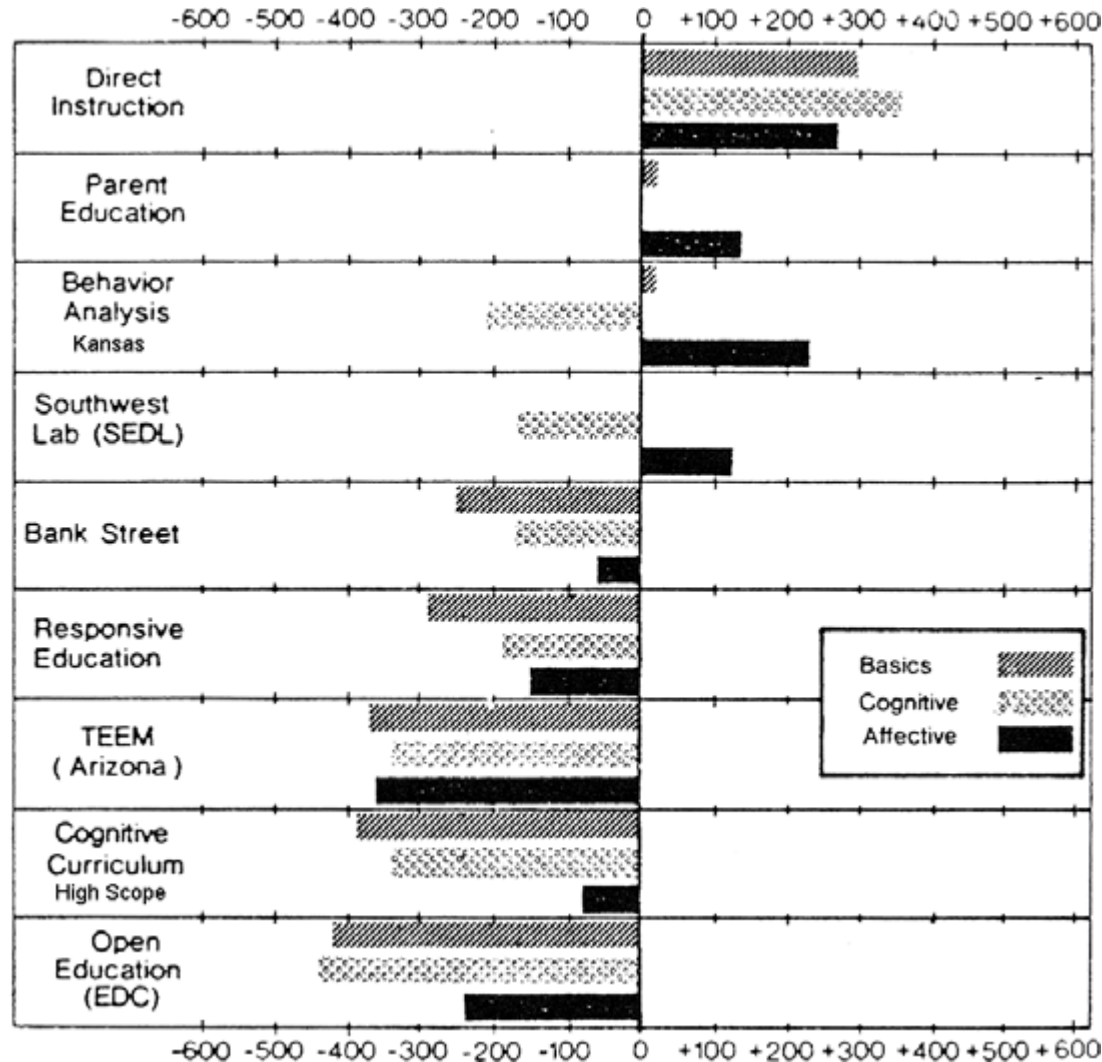
Education
is **design**
for
learning

We can and must do evidence-based e-learning design,
but each good design is a result of «art» created in and for a specific context.
Education *science* only can look at fragments, not the whole

Large scale comparisons between techno-pedagogical designs ?

None, only indirect unreliable comparisons:

- Scandinavian countries vs. others in PISA tests
- 1970's "Follow Through" (disadvantaged primary school children) \$600M implementation / \$30M evaluation study:
Students from difficult backgrounds need simple structured pedagogy



Becker & Engelmann, 1980's

Good practice seems to be contextual

5



E-learning =
A chance for
pedagogic
change ?

Innovation in schools ?

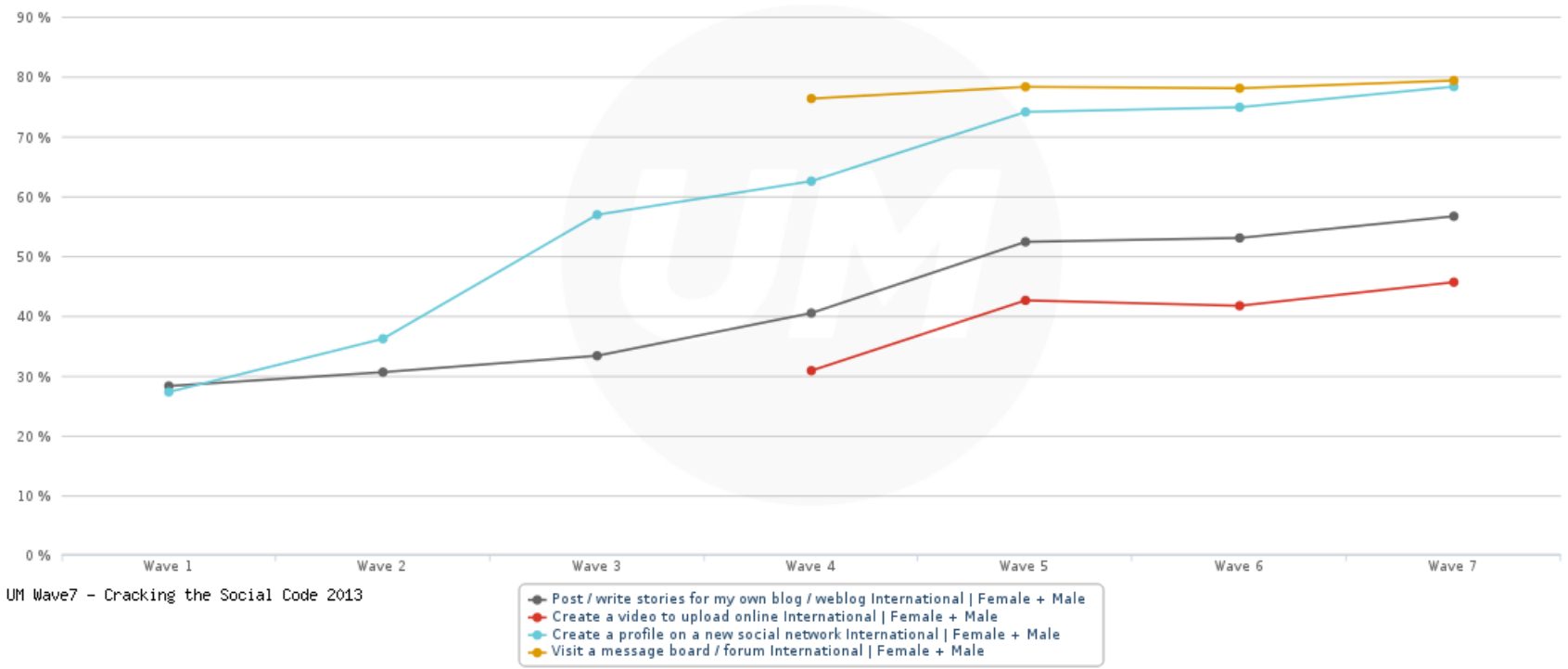
Burkhardt and Schoenfeld, Educational Researcher (2003)

- **Model 1: ~~Teachers read research and implement it in their classrooms~~:** teachers neither have time nor skills
- **Model 2: ~~Summary guides~~:** not explicit, not enough
- **Model 3: General professional development:** Long-term professional development for teachers can be effective. (Briars, 2001; Briars & Resnick, 2000).
- **Model 4: ~~The policy route~~:** diagnosis of causes is speculative, uses not effective time scales, etc. (Dillon, 2003).
- **Model 5: The long route:** takes 25 years or more: productive dialectic between educational research and practice.
- **Model 6: ~~Design experiments~~:** Work, but can't be scaled

Time needed for school-wide change= 25 years or more

Good News !

Penetration of active social tool use is on the rise (blog writing, video creation, profile create, visiting forums)



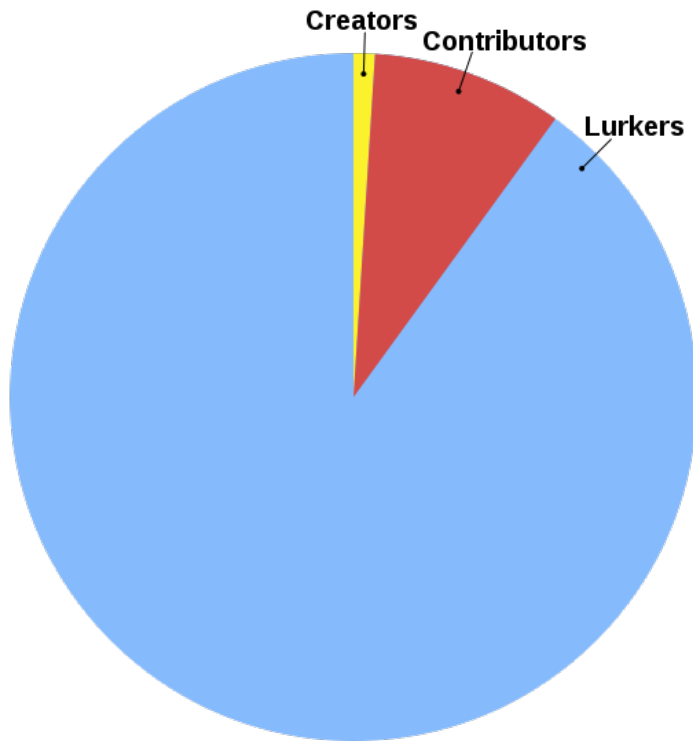
Source: UM Wave7 - Cracking the Social Code 2013

<http://wave.umww.com/>

However,

The Net generation (II)

1% Rule: Only **1%** of a **community** web site's users are **active**



Variants: *1-9-90 rule* or *90-9-1 principle*:

Within a community:

- 90% only view content,
- 9% edit content
- **1%** actively create new content.

[http://en.wikipedia.org/wiki/1%_rule_\(Internet_culture\)](http://en.wikipedia.org/wiki/1%_rule_(Internet_culture))

Wikipedia statistics (feb 2014)

- 18 billion page views
- 500 million unique visitors each month.
- 22 million accounts
- ~70,000 active editors (**0.01 %**)
- ~7000 do half of the content (**0.001 %**)

The Net generation (III)

People can:

- ... engage in digital conversation
- ... create simple digital objects (messages, videos, posts, ...)
- ... exchange digital objects

People cannot:

- ... use professional software
- ... participate in knowledge creation environments
- ... articulate scenarios

Internet skills are **conversational**

Full **ICT** and **knowledge working skills** must be taught (some of it can be **enforced** in formal education !)

Today's teacher trainers:

- don't know how to use technology
- have a poor understanding of general pedagogy (instructional design)

E-learning is hard

- Most young teachers cannot cope
- Have to re-invent the whole wheel
- Infrastructure is bad (even in Canada)

However

- E-learning does work all over the planet
- Many interesting creations

Intentions are not behaviors

Attitudes do not replace skills

Good education is expensive

Pedagogy is contextualized design

Trojan horses need people* inside
... and that's the bottleneck !!!

*that means you

Change will only happen if there is a massive effort to:

1. discuss educational goals,
2. agree on a few fundamental principles,
3. identify means and strategies
4. allow teachers to learn

Thank you
for listening

Questions ?
Comments ?

<http://edutechwiki.unige.ch/>