

Pedagogical theory for e-Learning Design: From ideals to reality?

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FACULTÉ DE PSYCHOLOGIE
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Menu

1. What is e-learning ?
2. The role & evolution of technology
3. Educational principles – e-learning principles ?
4. People ?
5. E-learning and pedagogic change ?

1.

What is
e-learning
?

E-learning (widely defined):

Digital education

Technology-enhanced learning

ICT in education

Learning with technology

Instructional technology

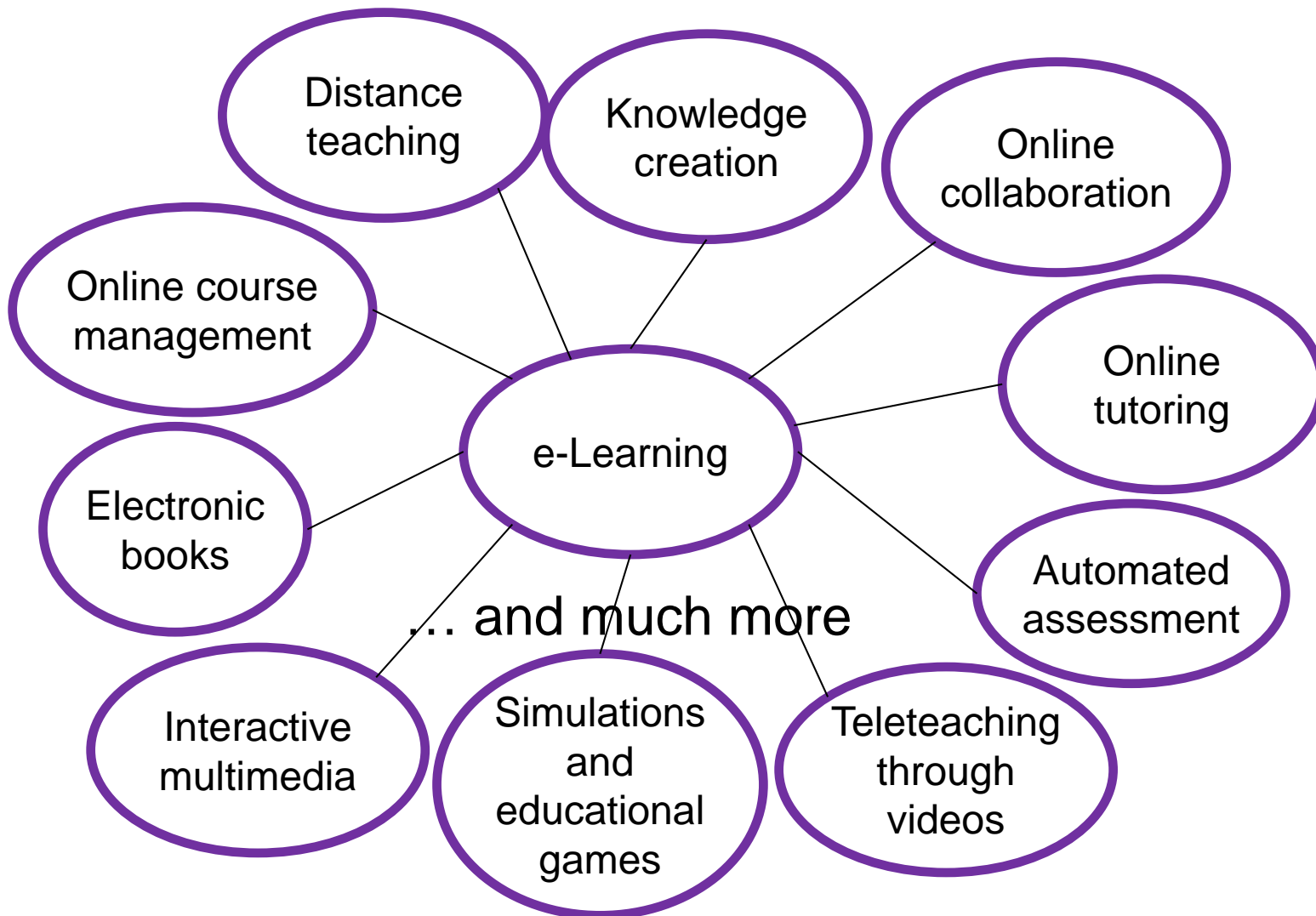
Educational technology

Other words to talk about the same subject ...

Academic fields of research & study

... the **study** and **practice** of **facilitating learning** and **improving performance** by creating, using, and managing appropriate **technological processes and resources**. (AECT)

E-learning Widely defined



- in distance teaching
- in mixed (blended) teaching
- in presence teaching

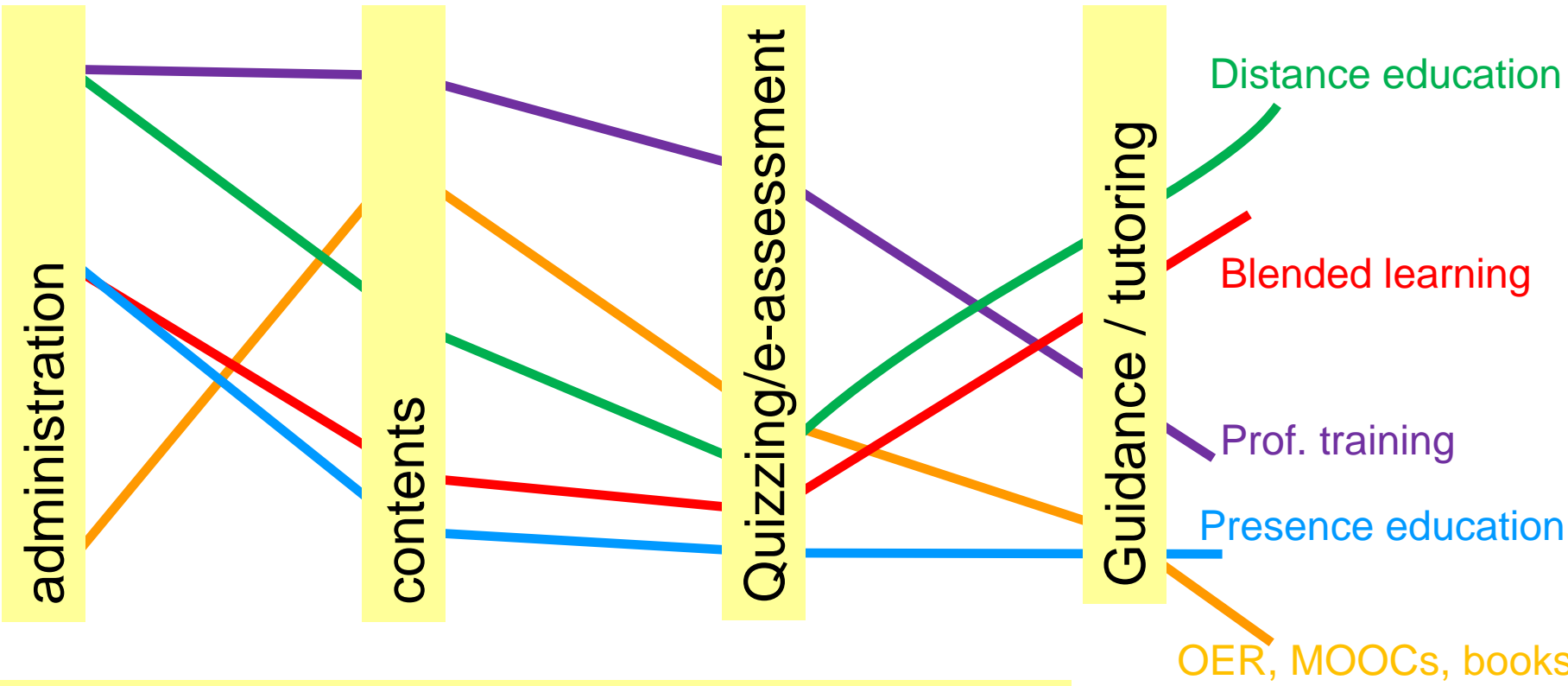
- in formal schools
- in formal workplace learning
- for informal learning

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

Use of technology in different domains:



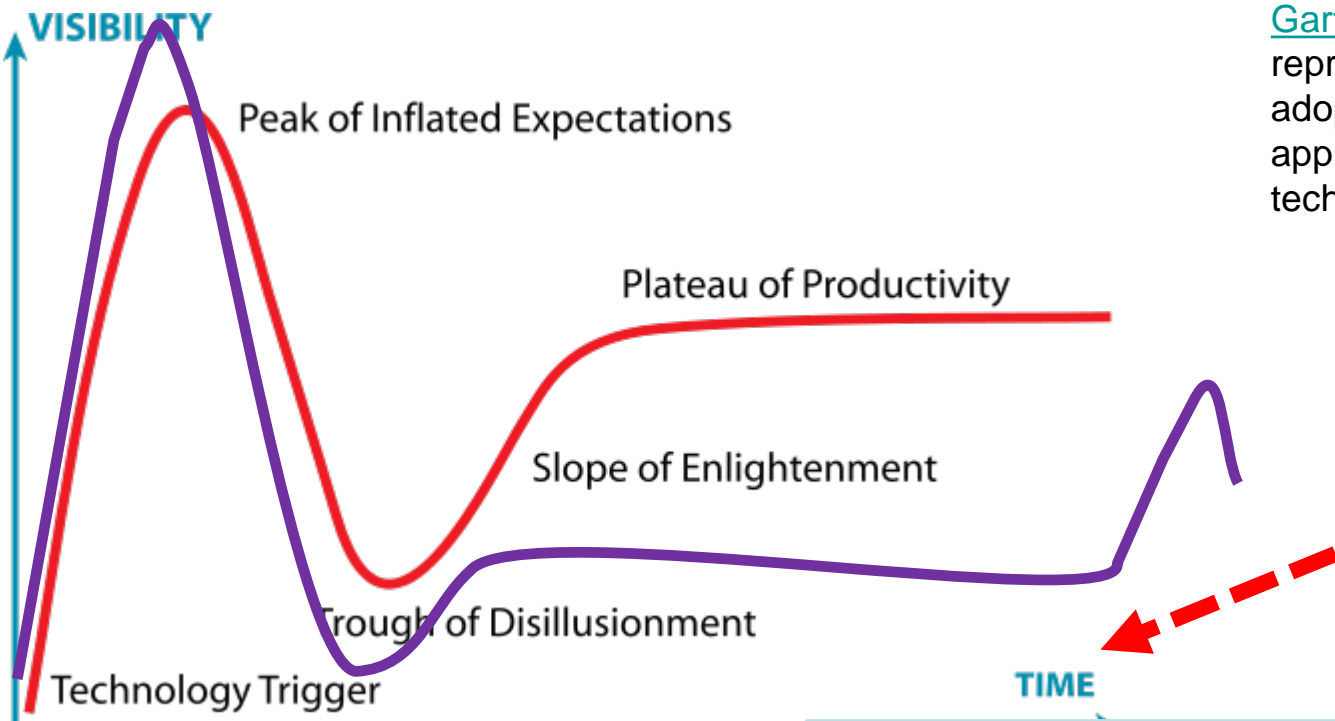
Reality does not match potential:
... quality could be improved
... scope and richness could be expanded

2 ■

The role &
evolution of
technology

E-learning = A history of 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.

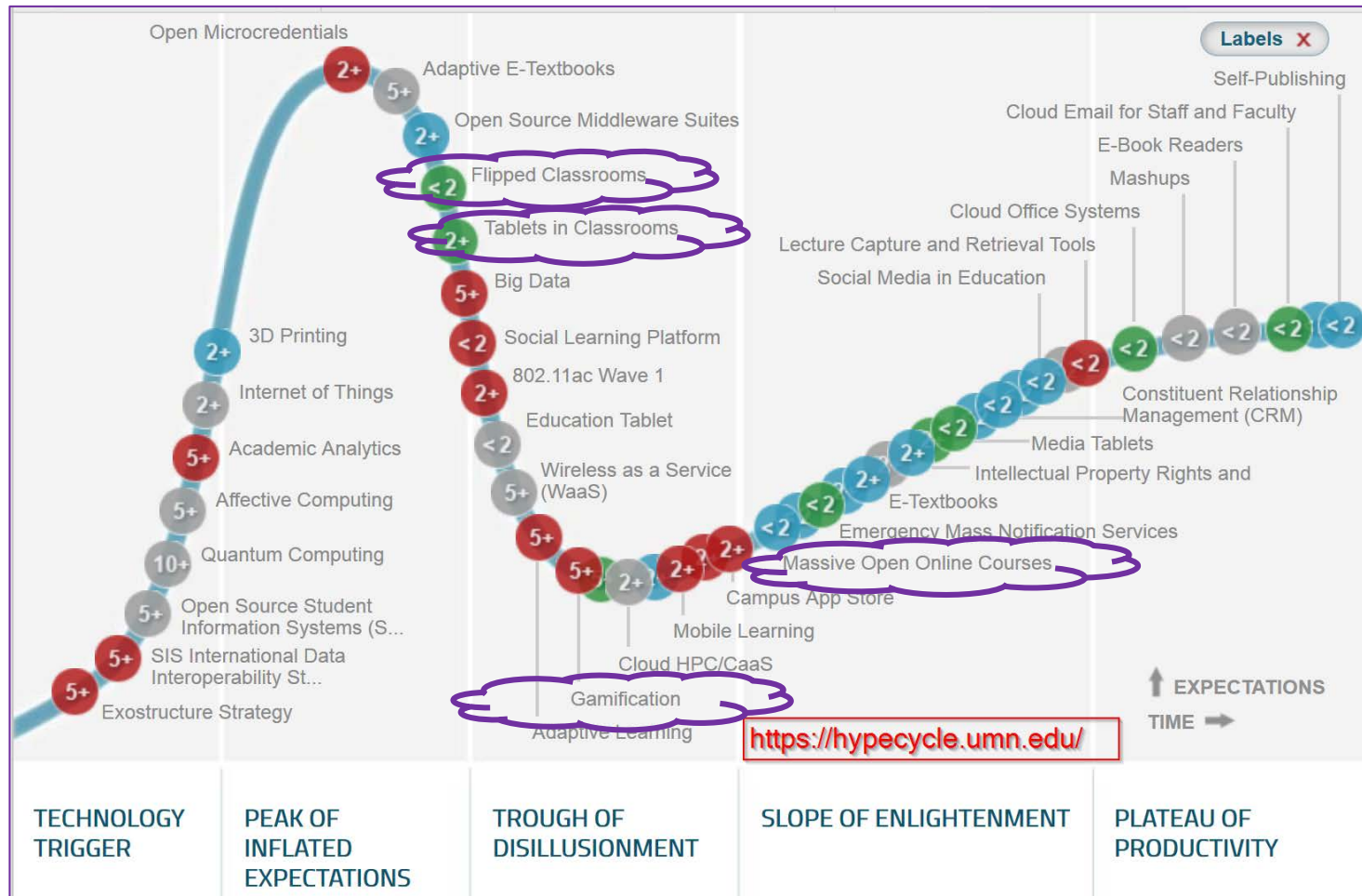


2 - 25 years

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

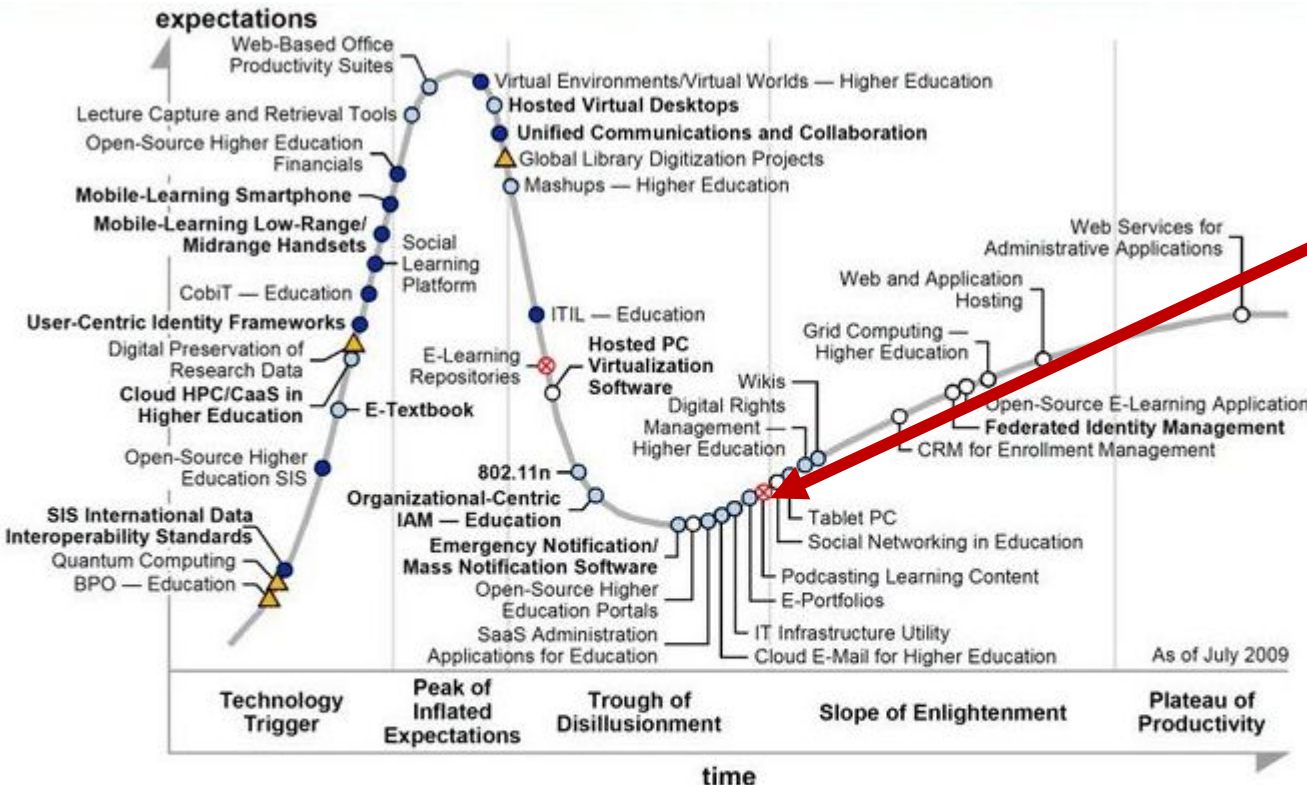
Technology, not pedagogy, triggers new cycles (mostly)
Technology is the driving force, even if we do not like it ...

The technology hype cycle in education (Hypecycle, 2014)



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

It is difficult to predict the future: Gartner etc. can be very wrong



2009:
Gartner's
education hype
cycle:

«Podcasts/Edu
cational TV are
dead»

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

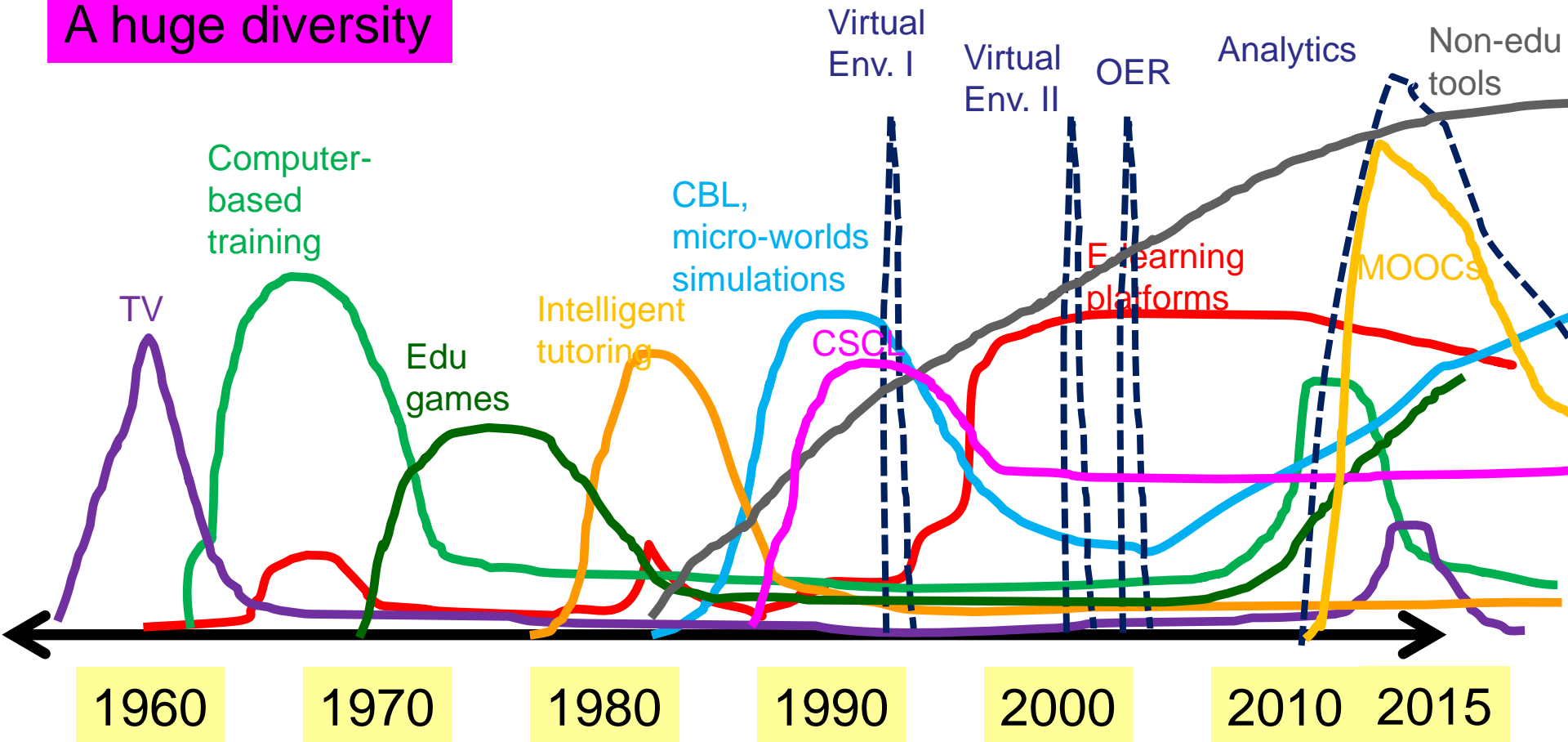
- Off the Hype Cycle
 - Personally Owned Devices with network access
 - RFID Library Materials
 - IP-video for e-learning



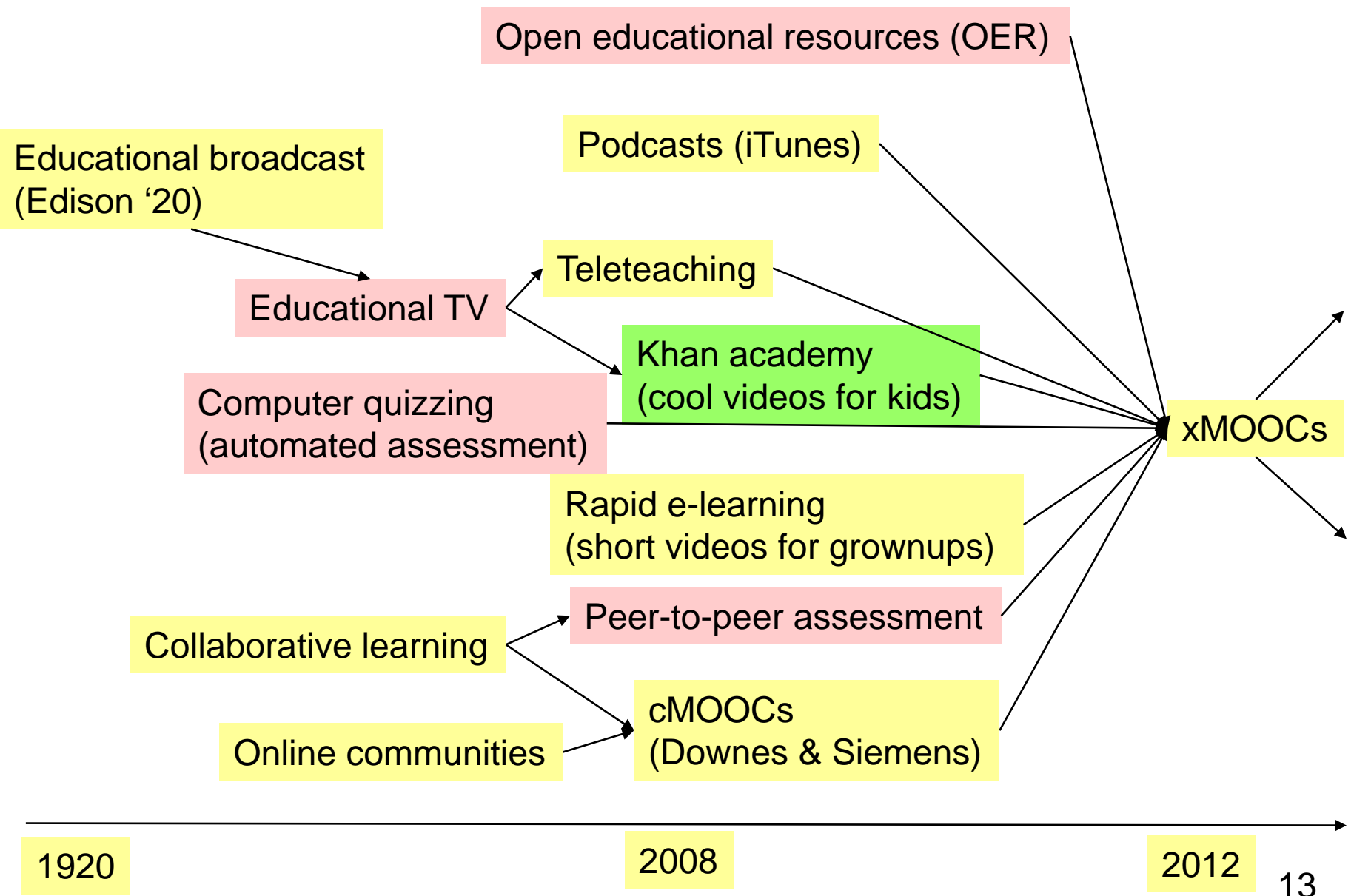
E-learning - «Big inventions» about every 10 years

- New administrative structures are created,
- little communication between new and old structures
- 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...



Before following the latest hype:



Ask if it is compatible with sound instructional design principles ?
.... with your ideals of teaching ?



Look at past achievements of similar technology



Analyse what a new technology can do (affordances for different pedagogies)

3 . ■

Educational
principles –
e-learning
principles ?

Are there first
principles of good e-
learning design ?
Is there an «e-
learning theory» ?

First question: what is good education ? (M. David Merrill)

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**

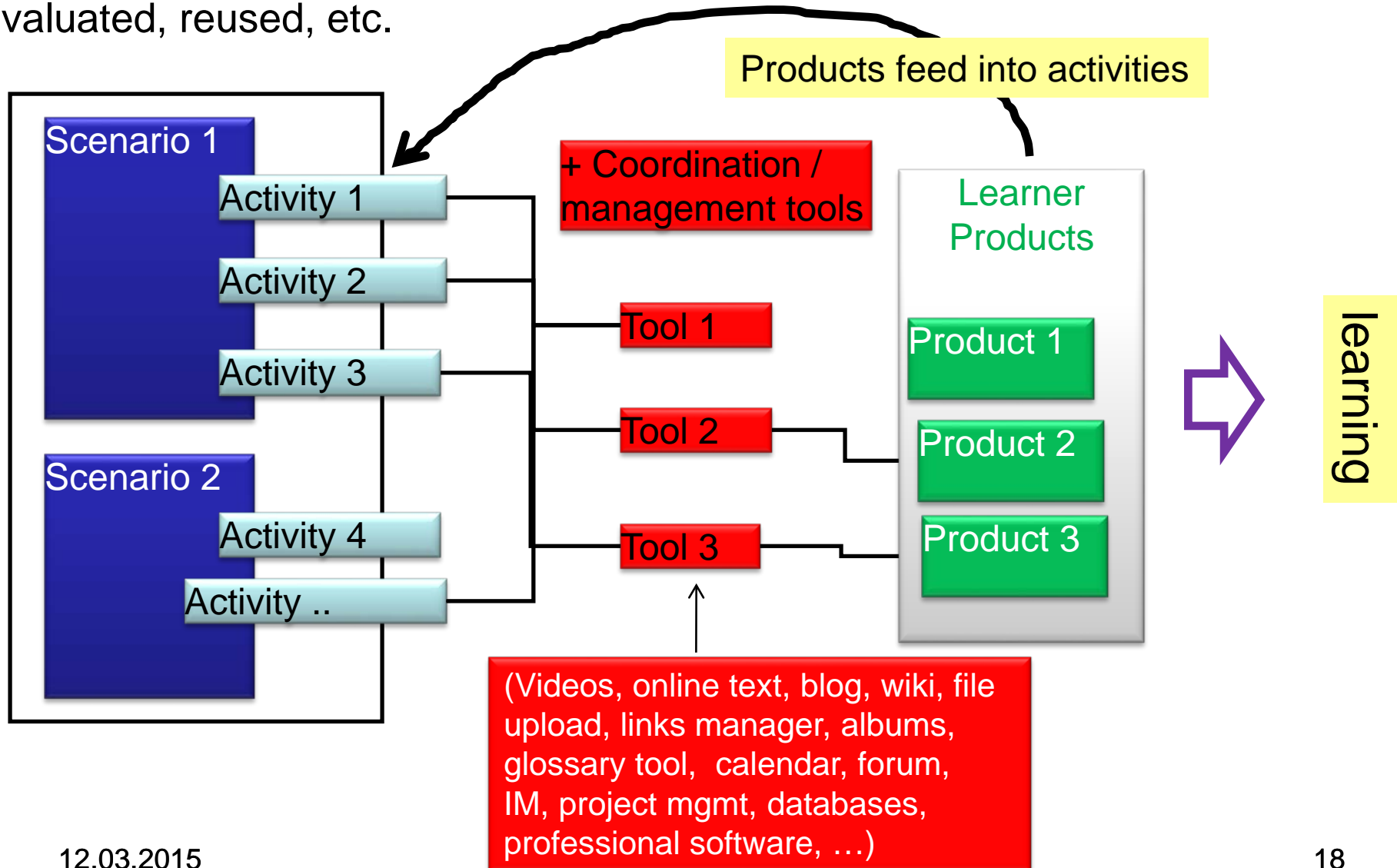
5. The task-centered principle

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

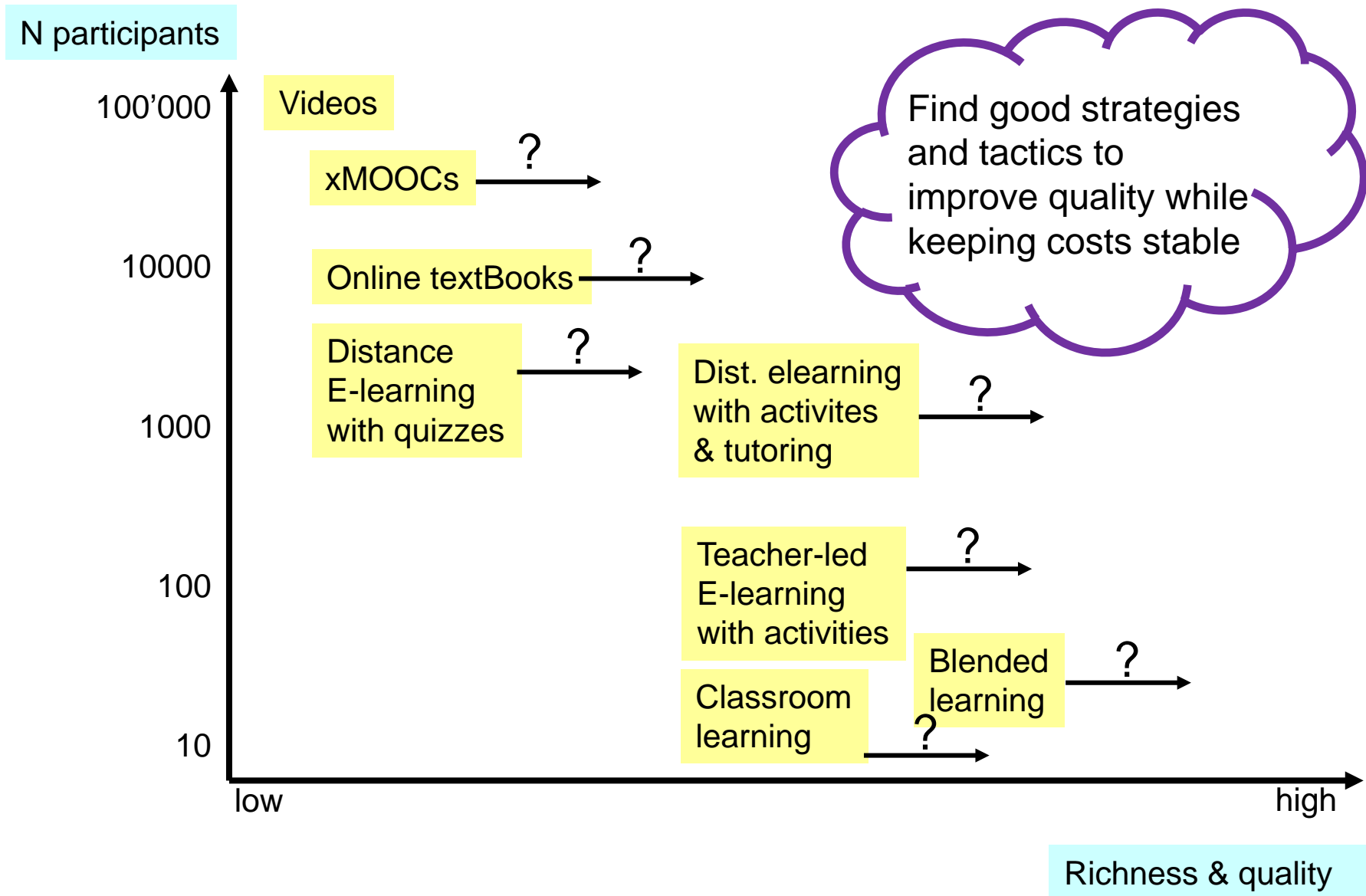
<http://mdavidmerrill.com/Papers/firstprinciplesbymerrill.pdf>

Second question: what can e-education “add” to education ?

Activities are **supported by tools** (incl. digitized resources).
Some activities can lead to tangible “**products**”, which can be discussed, evaluated, reused, etc.

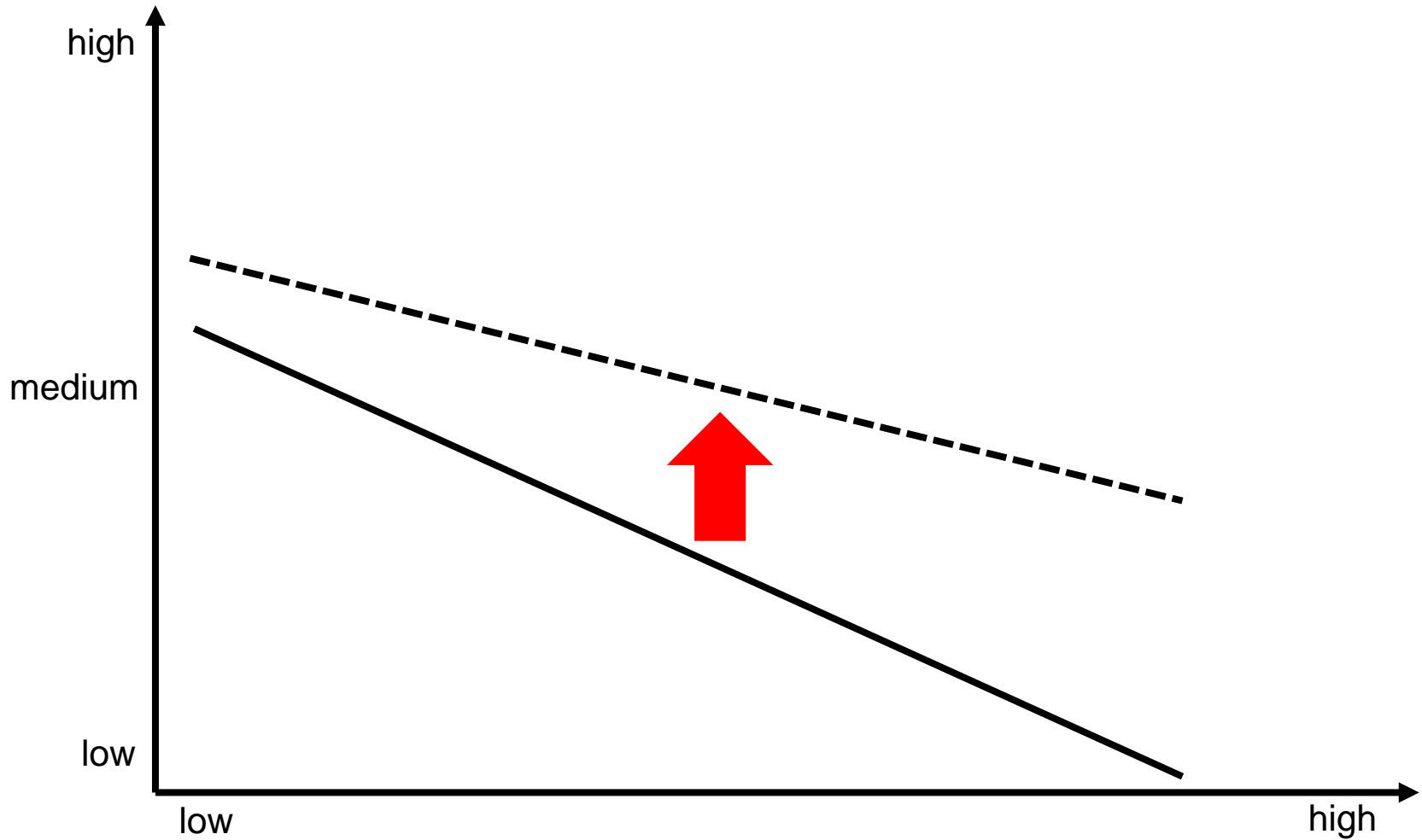


The e-learning challenge – make it better (1)



The e-learning challenge – make it better (2)

Quality



N participants

The bottom line from many meta studies:

Quality is more important than type of design
(good transmissive learning is better than bad constructivist)

Ambitious strategies require “scripting”
(who does what when with which resources)

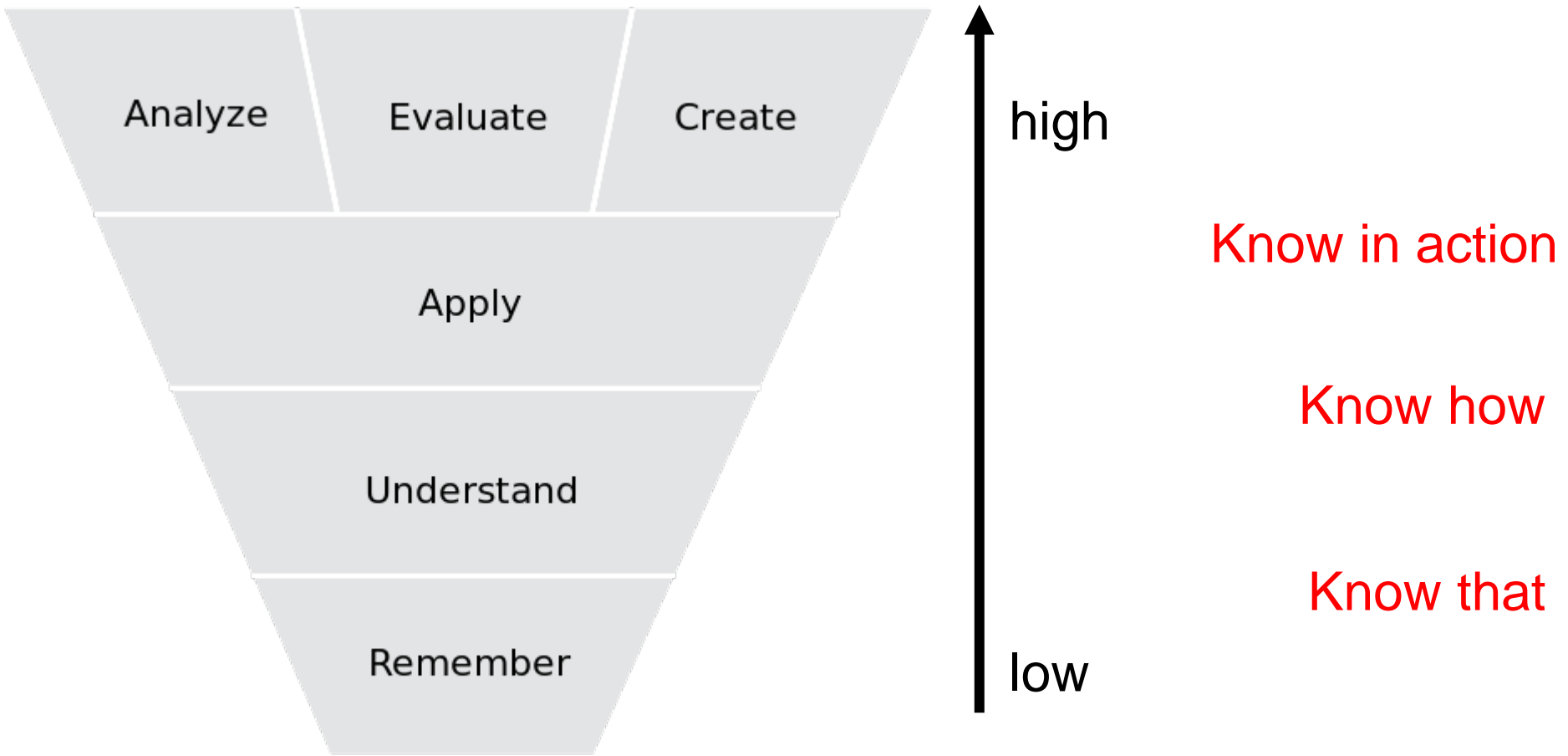
Most learners need (formal) challenge
(informal self-guided learning cannot replace formal learning)

Learners need guidance and feedback

Education
is **design**
for
learning

E-learning is **design** for learning,
enhanced with digital tools

Adapt pedagogy to learning level / type



Anderson & Krathwohl taxonomy

(picture from Wikipedia)

12.03.2015

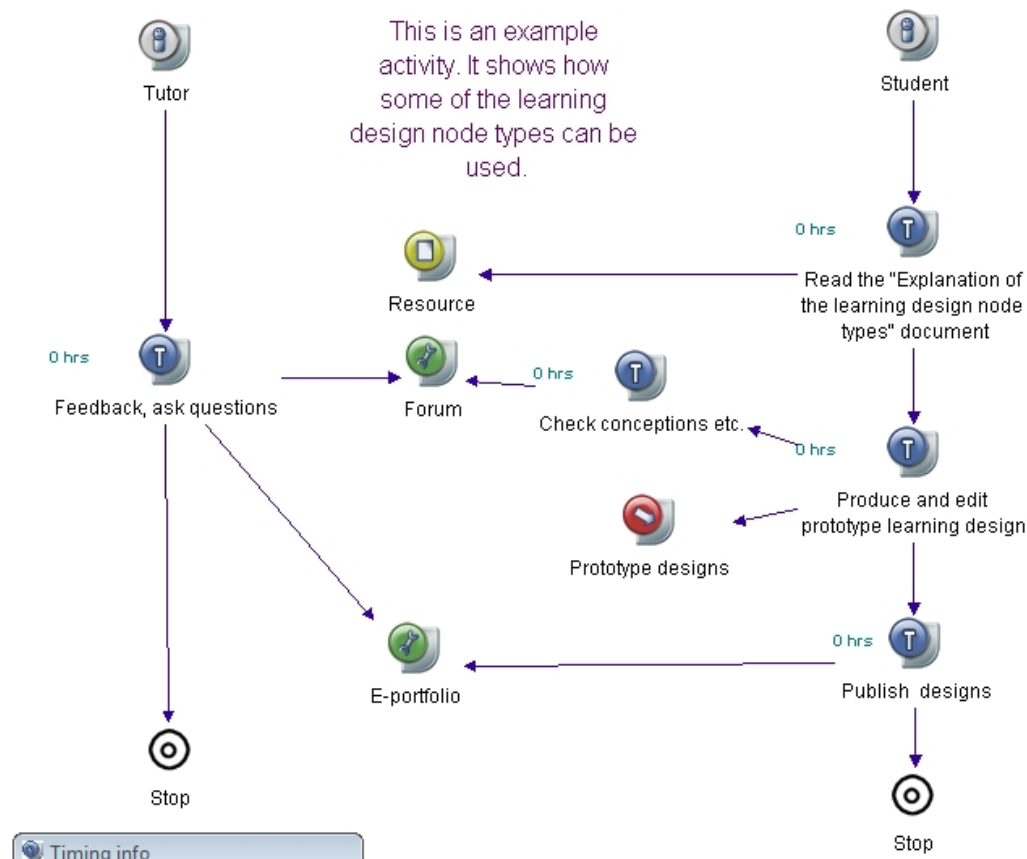
- Define learning objectives
- Adapt teaching strategy & tactics to objectives

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, e-portfolios, etc.
III: knowing in action	III Situated action : strategies in complex and authentic situations	project-based learning	Social software, portalware, Word processors, CAD, e-portfolios, simulation software, laboratory software, etc.
IV: Other	IV Other: e.g. motivation, emotion, reflection	ARCS, learning portfolios	Tools that favor presence and reflection.

Define

- who does what (**tasks/activities**) and when,
- using tools and resources



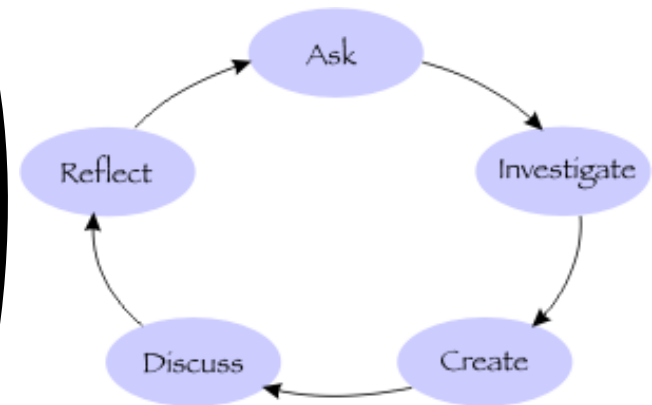
CompendiumLD
(Learning design
software)

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**"
 - Practice skills or apply knowledge.
7. Provide **informative feedback**
 - show correctness of the trainee's response, comment learner's behavior,
8. **Assess** performance, test if the lesson has been learned.
 - Also provide general progress information
9. **Enhance** retention and **transfer**
 - Provide additional practice. Put the learner in a transfer situation,...

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

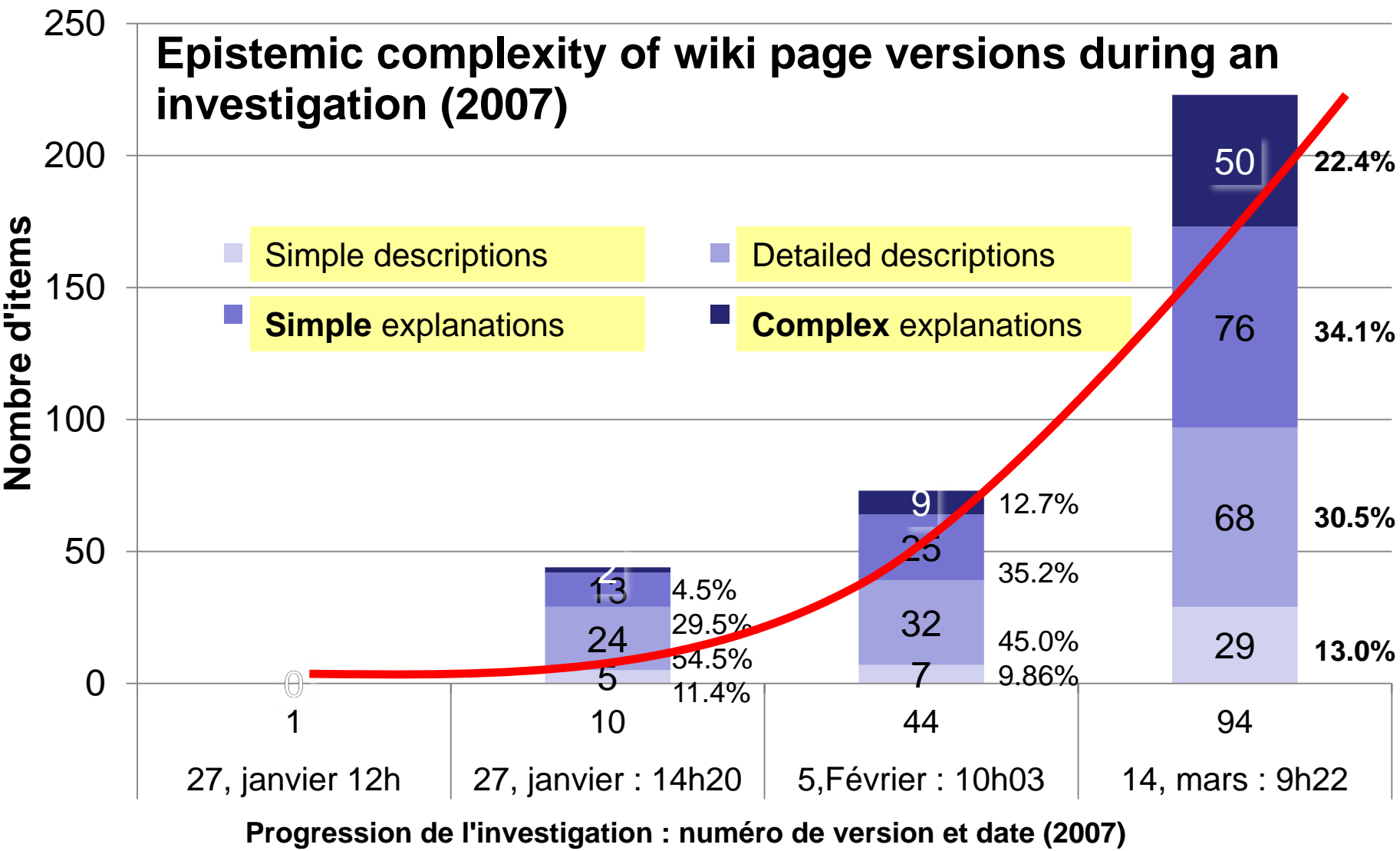


The crucial difference between current formulations of inquiry and the traditional "scientific method" is the explicit recognition that inquiry is cyclic and nonlinear.»

■ Sandoval 2004p. 216

Some strategies take time: Inquiry learning (Lombard, 2012)

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



Learners must be **tutored**

- Break down learning activities into steps
- Assign clear roles to tutors

Learners must become **part of a community**. E.g. use:

- chat sessions,
- flipped classrooms
- knowledge co-construction activities
- sharable e-portfolios
- peer commenting/tutoring/evaluation

Failure rates:

- MOOCS: 95%
- Distance education with little tutoring: 60-70 %
- Distance education with tutoring and presence: 5-20 %

Good e-learning:

..... uses an appropriate pedagogical **strategy** aligned with goals, means and other constraints

..... creates **active** learning and **active** learners

..... Uses **technology to enhance** delivery, cognition, tutoring, collaboration, evaluation. etc

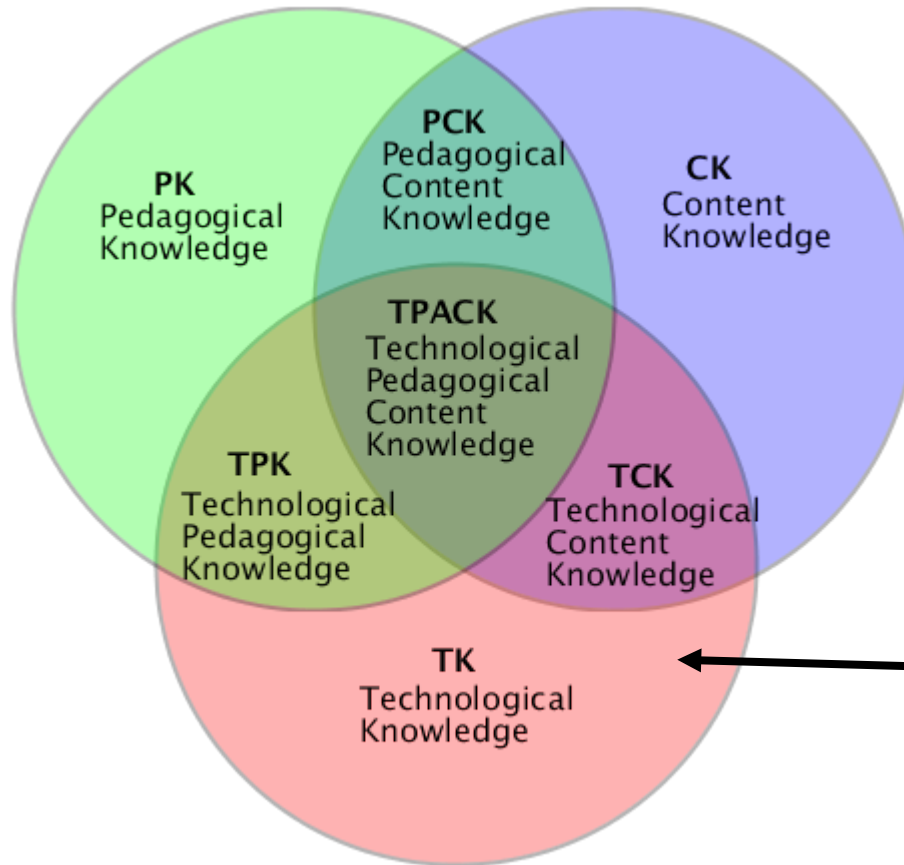
Good e-learning technology:

Supports educational **strategies** and **tactics** with **appropriate tools**

4.

People ?

Teachers should be trained in using technology for education



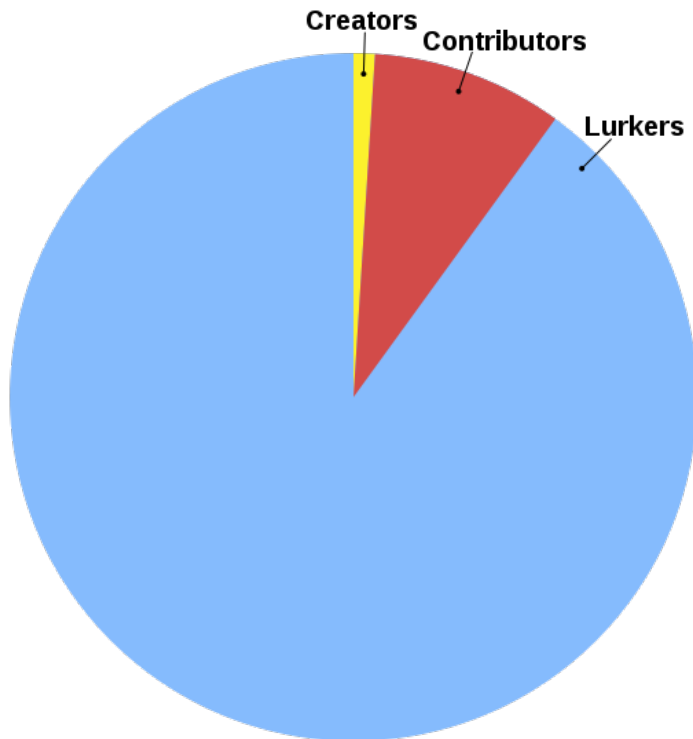
TPACK = be able to create technology enhanced teaching designs (that include use/teaching of domain technology too)

(Koehler & Mishra)

TK, TCK, TPK and TPACK is missing from teacher education

The TPACK framework (teacher development)

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 – students and teachers (II)

Digital natives can:

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

Digital natives cannot:

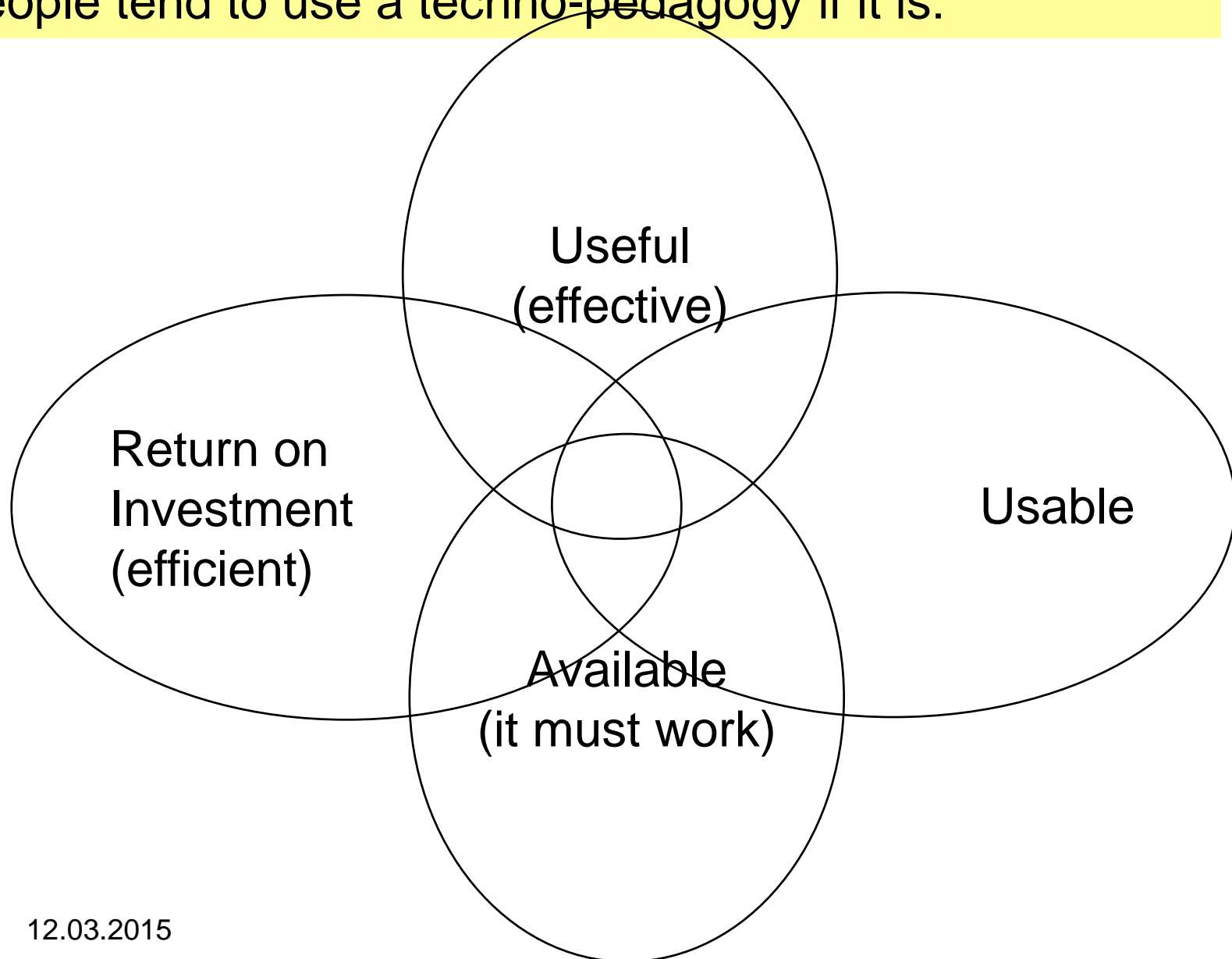
- ... use professional software
- ... participate in knowledge creation environments
- ... articulate or even follow scenarios

Internet skills are **conversational**

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

Technology acceptance

People tend to use a techno-pedagogy if it is:



5



E-learning
and
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

Best unit for change is school ... a system may need >100 years

E-learning offering the same quality as traditional teaching costs more ! Therefore, try reducing costs:

Use standards

Automatize
what can be

Focus material
production on
difficult matters

Reuse OER

Use/repurpose domain
tools, e.g. engineering
software, online word
processors,

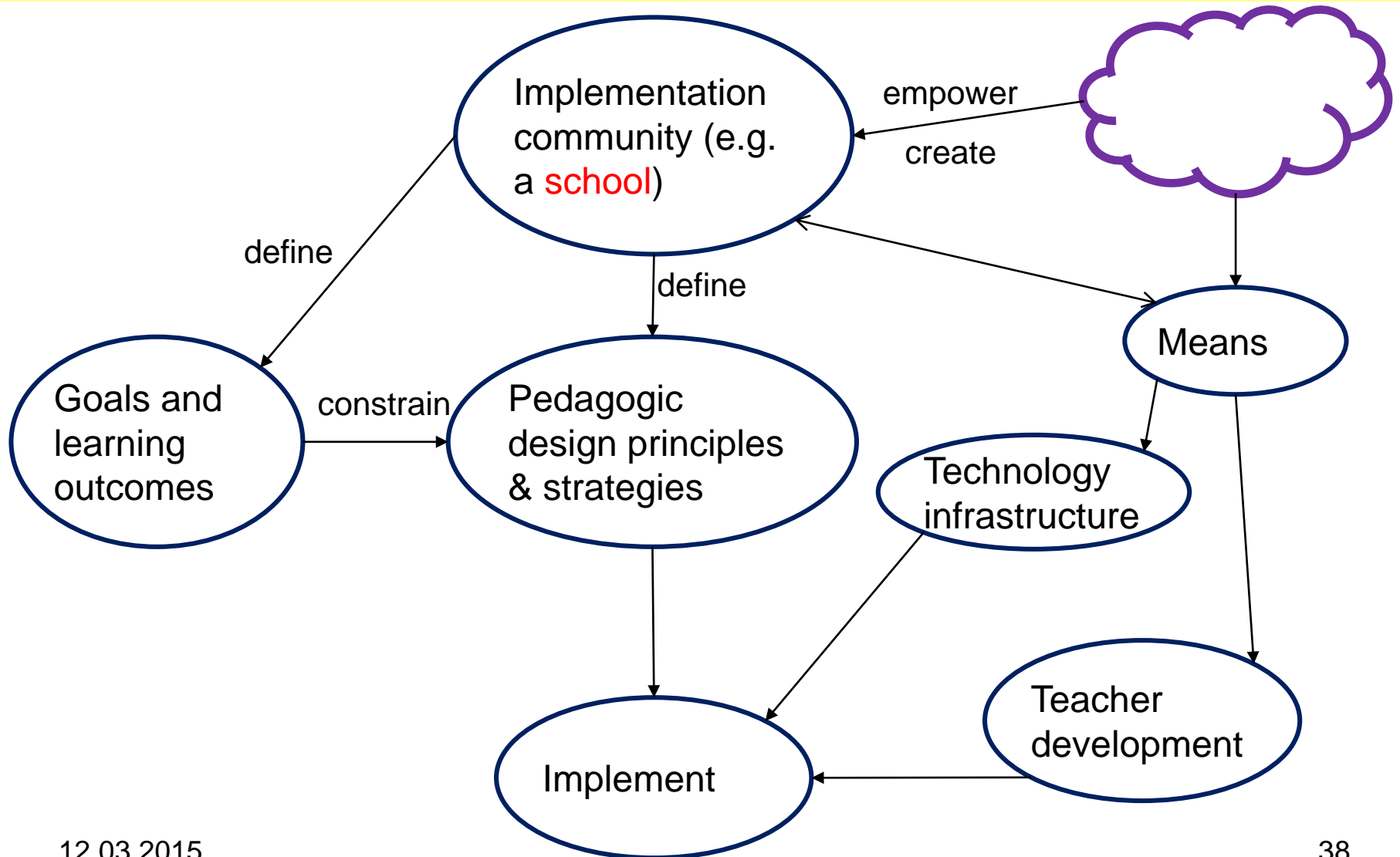
Have students
contribute
(materials,
tutoring)

Peer-tutoring /
commenting

Some ideas

Conclusion

There is no universal e-learning implementation theory, but some principles that are supported by empirical evidence



Thank you
for listening

Questions ?
Comments ?

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