Some ideas for reducing eLearning costs

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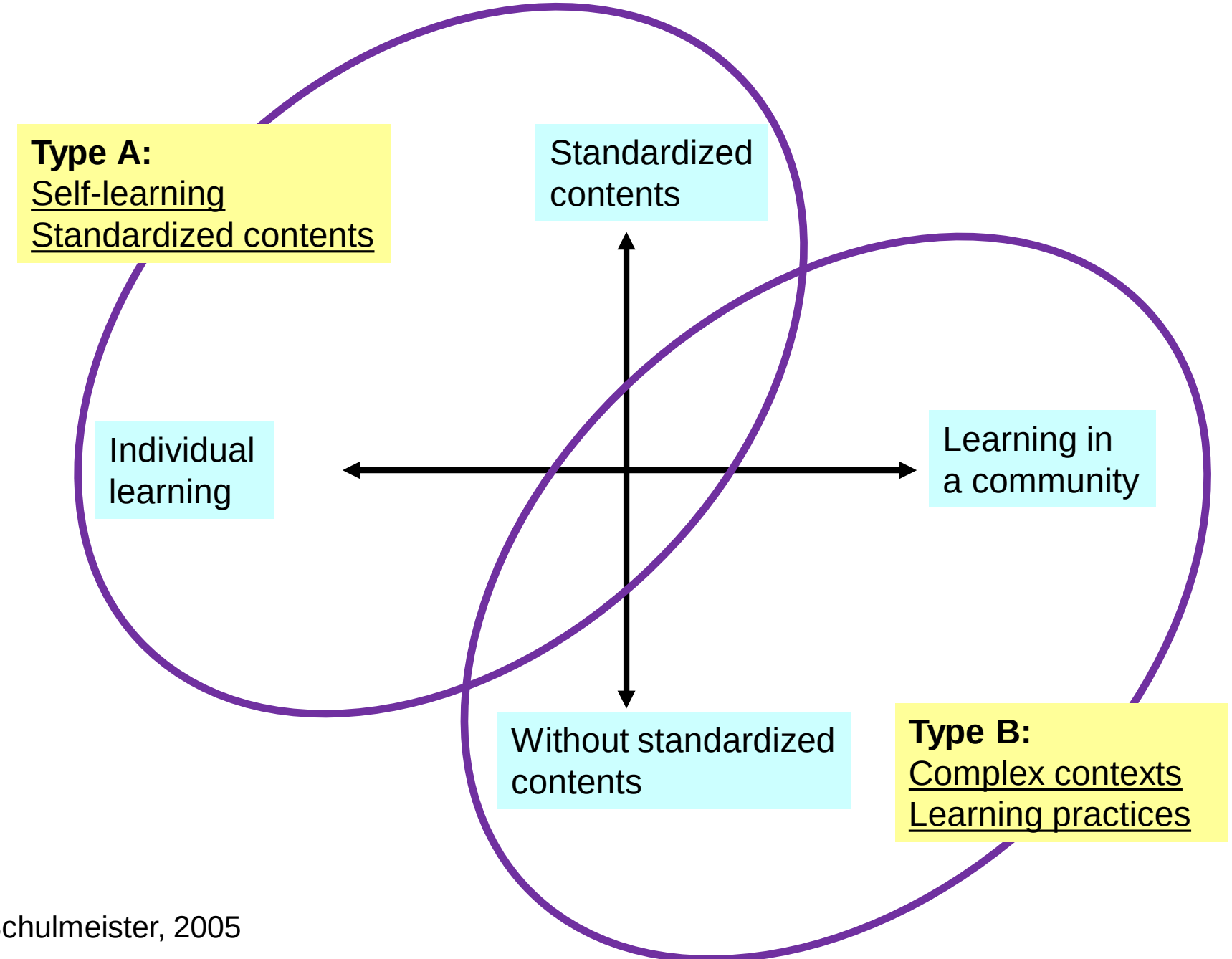
1. What do we mean by “e-learning”?

(a little recall)

Dominant e-learning practices include:

- In distance education
  - Organisation & tutoring,
  - Online materials (texts, videos)
- In presence education
  - Digitizing of existing practice
  - Classroom technologies
- In blended education
  - Guidance & communication
- In workplace learning and training
  - Simple facts and procedure learning using online
  - Online materials (texts, CBT, screencasts, videos)
  - Simulations of procedures and practice
- Informal mass education
  - Open educational resources, MOOCs

Two big variants of e-learning



Schulmeister, 2005

Definition of e-learning

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)

(1) facilitating

(2) improving

(3) using technology

Objective:

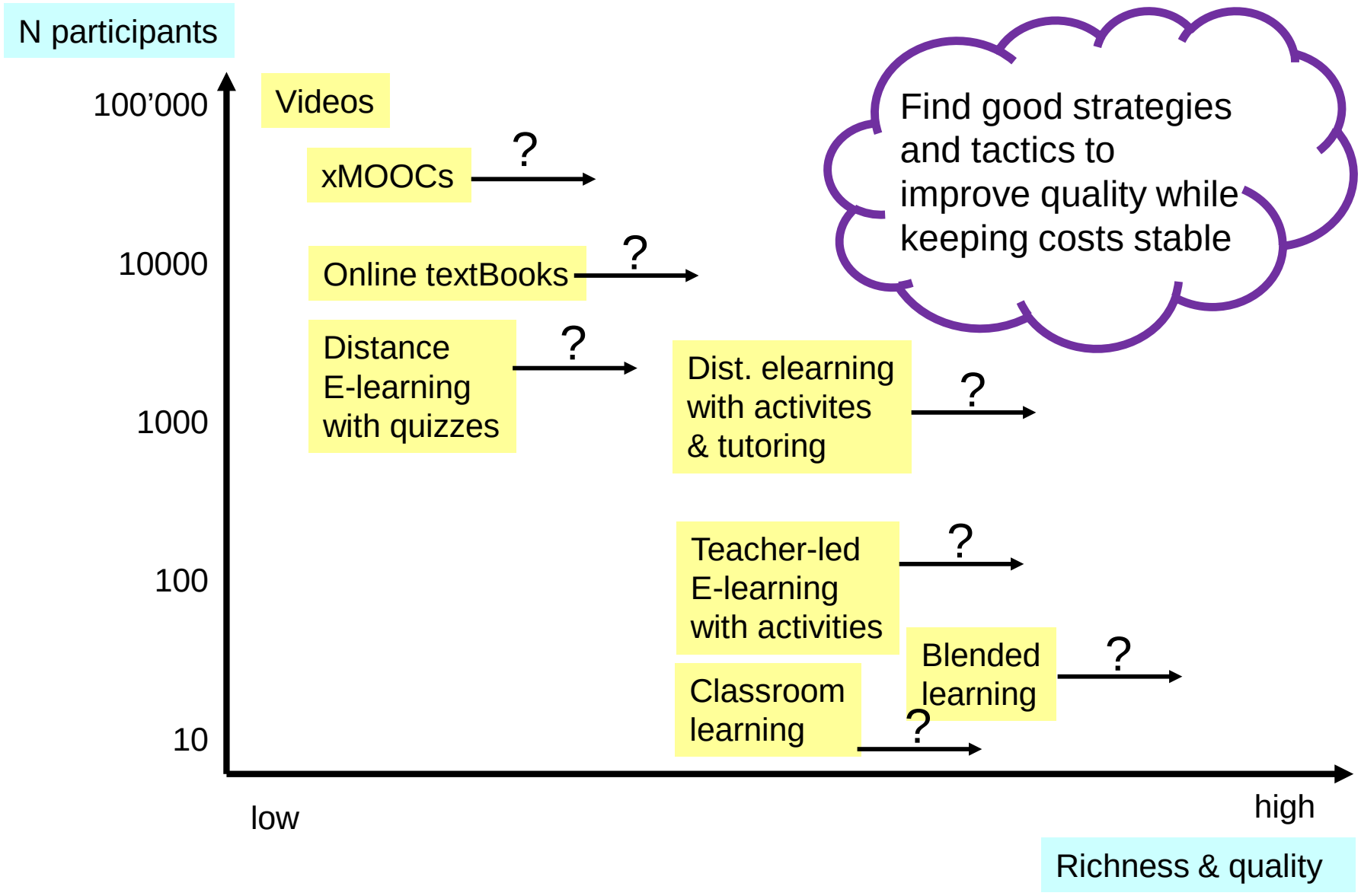
Present and discuss some ideas for reducing cost without reducing quality

Menu:

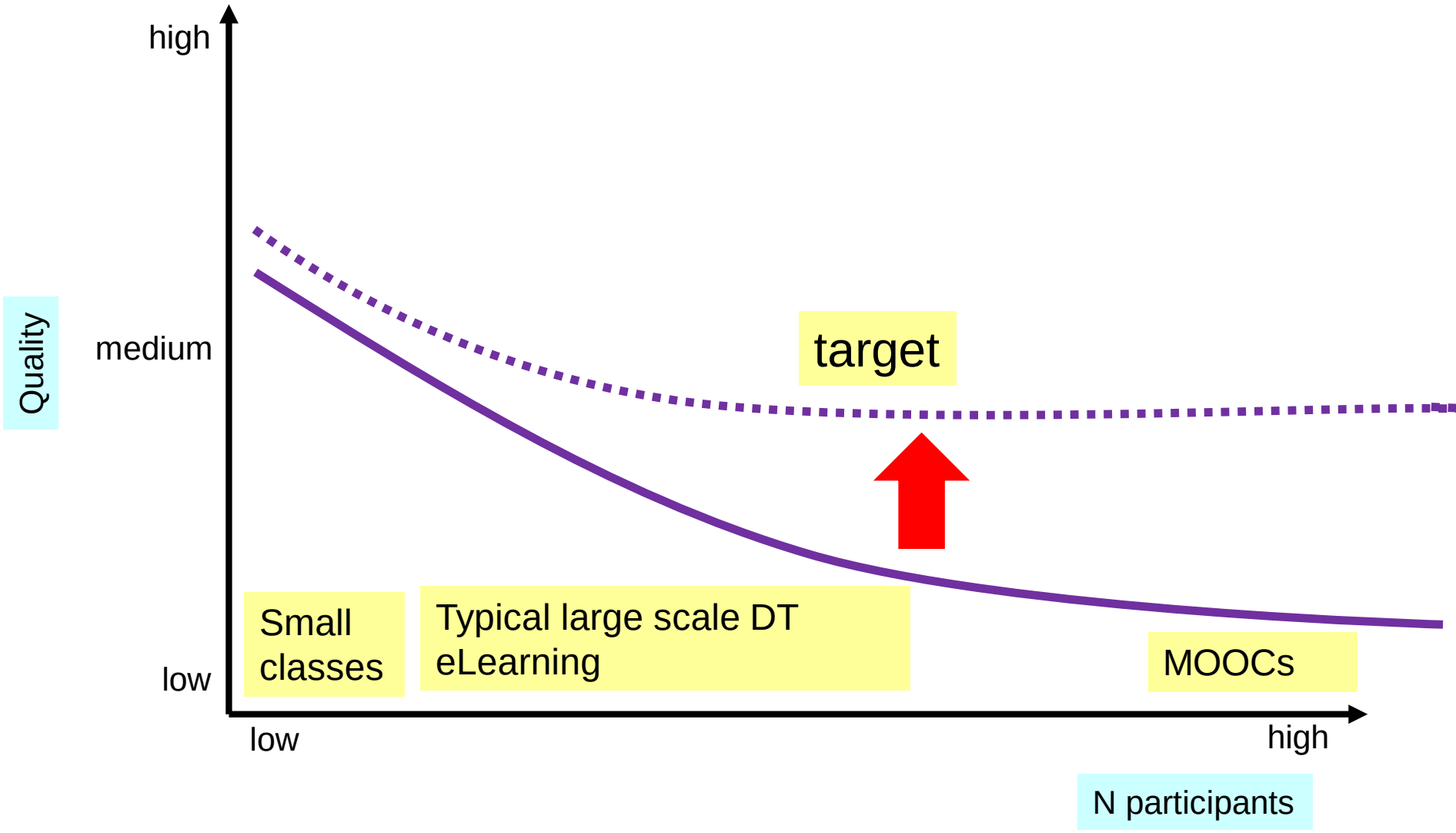
The eLearning challenge
Technological change and long term thinki
Educational principles and

2. The e-learning challenge and a first look at cost.

The e-learning challenge – make it better – more with less

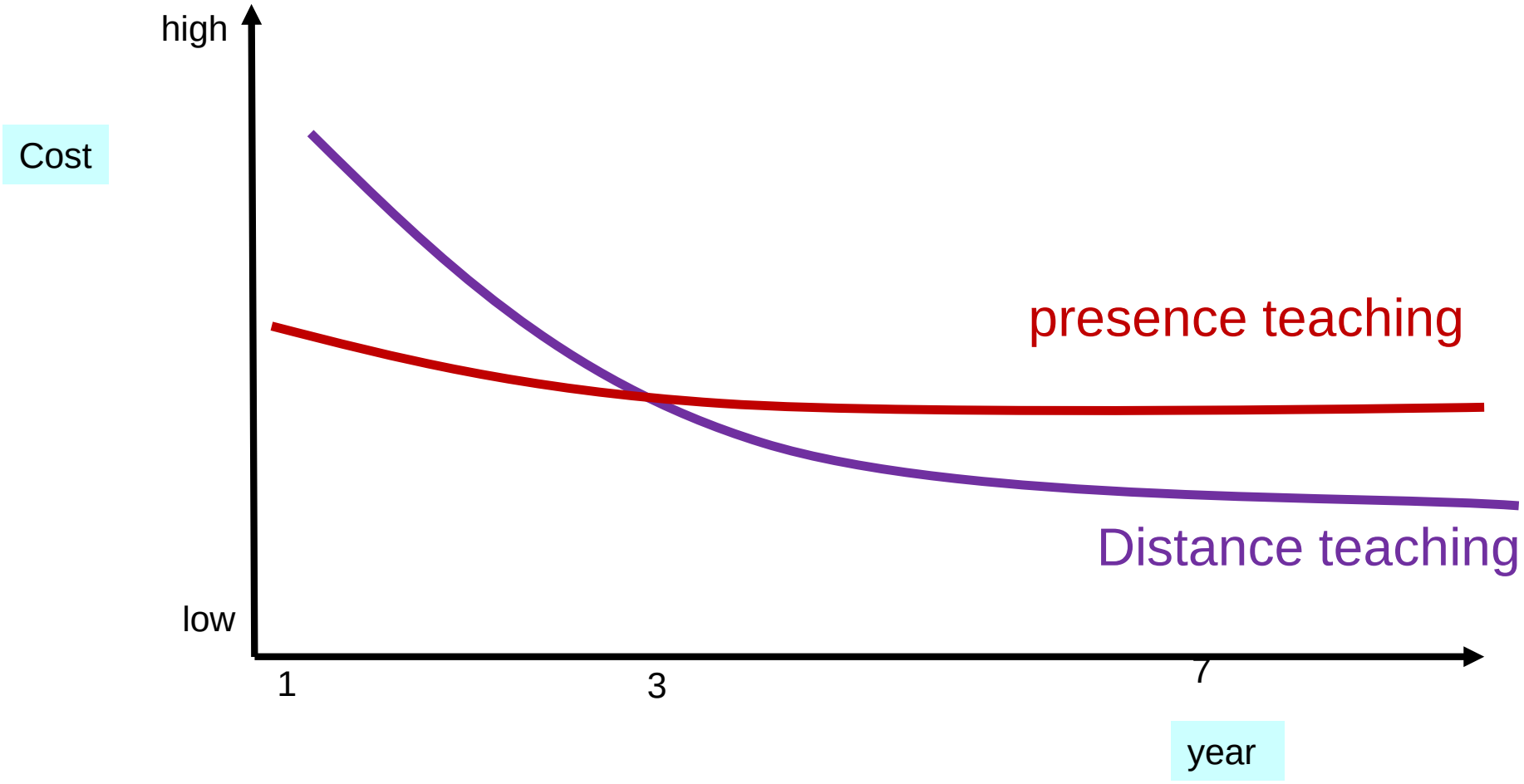


The e-learning large student numbers challenge – make it better that it usually is …



The e-learning challenge – be cheaper than presence teaching

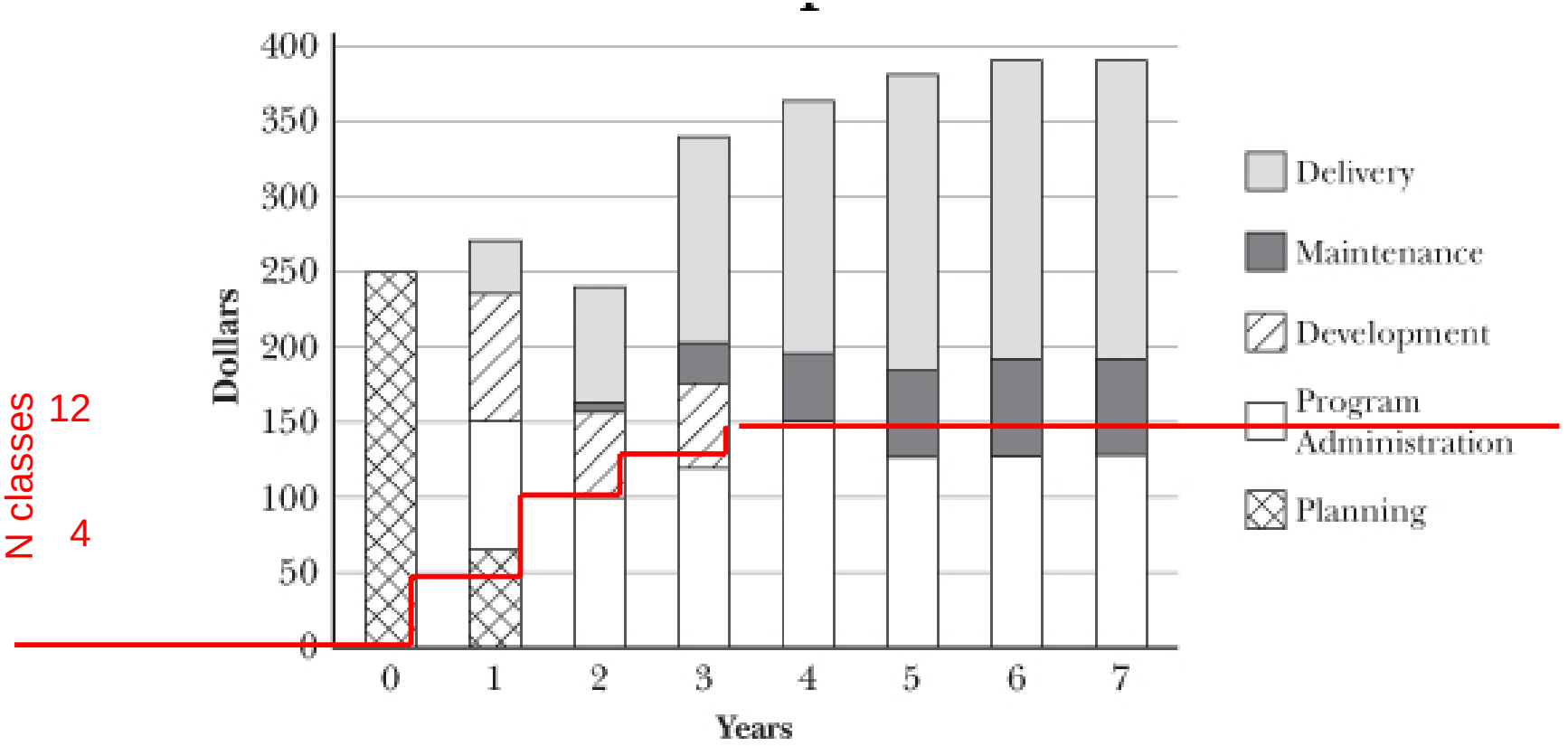
DT can get cheaper than presence around years 3,4,5



Most cost remain stable over time

UCB master program business plan, case discussed in Bates & Sangra (2011:144)

- Development is replaced by maintenance
- Delivery (mostly tutoring & assessment) remains stable at 36%
- Target N students in year 7 = 40
- Cost / class = $1100 USD



Typical e-learning benefits and costs

Notice: General lack of understanding of digital technology, elearning and distance learning costs (Bates and Sangrà. 2011).

Benefits:

- Flexibility (“distance” is distance, time of day, time available,..)
- Sharing of costs culture improved (major effect of MOOCs)
- Diminishing costs with augmenting student numbers

Costs:

- Delivery
- Maintenance
- Development
- Program administration
- Planning

I have some ideas on how to reduce these

A first look at cost

General rule #1:
E-learning of equal quality is about as expensive as non-digital learning (more tutoring, development, etc.)

General rule #2:
Cost structure is different for different uses of technology

General rule #3:
Planning, delivery (and sometimes) development cost are underestimated and contribute to rebellion and failure

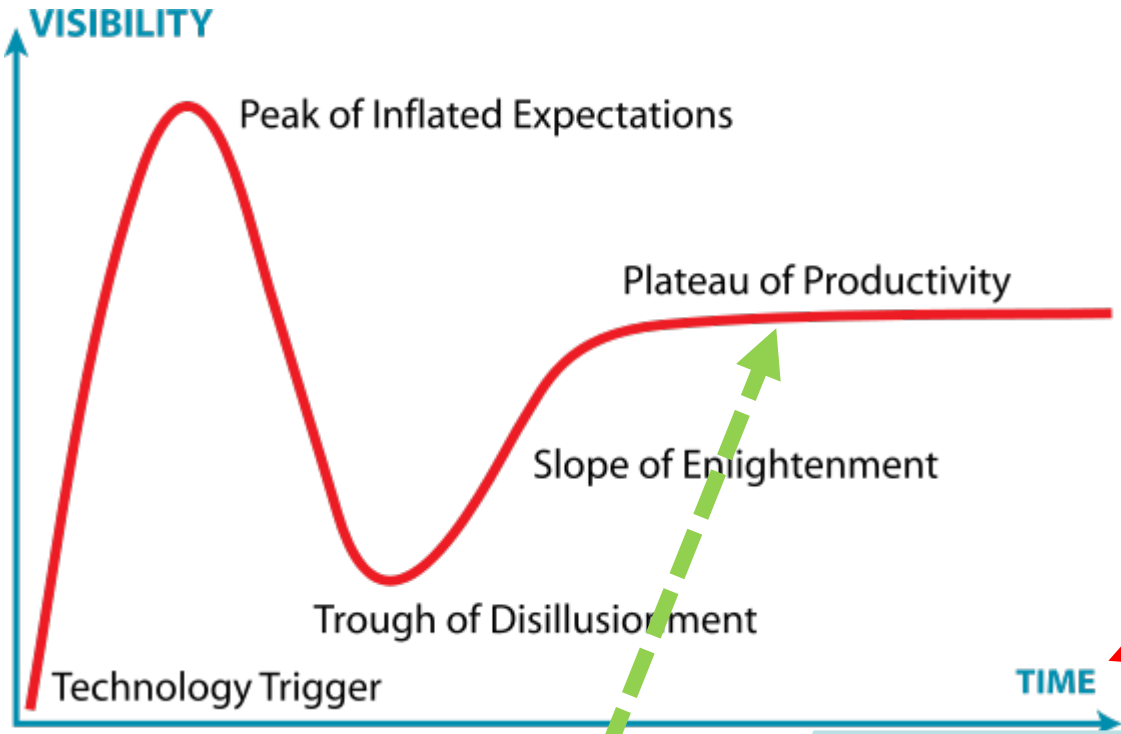
General rule #4:
Cost reduction can be achieved through long-term thinking, synergy (e.g. open resources), design thinking and development of e-learning competency

Subjects of this talk

3. Technological change (need for long term thinking)

E-learning = A history of “hype cycles”

The **Hype Cycle** is a branded graphical tool by Gartner Consulting for representing the maturity, adoption and social application of specific technologies.

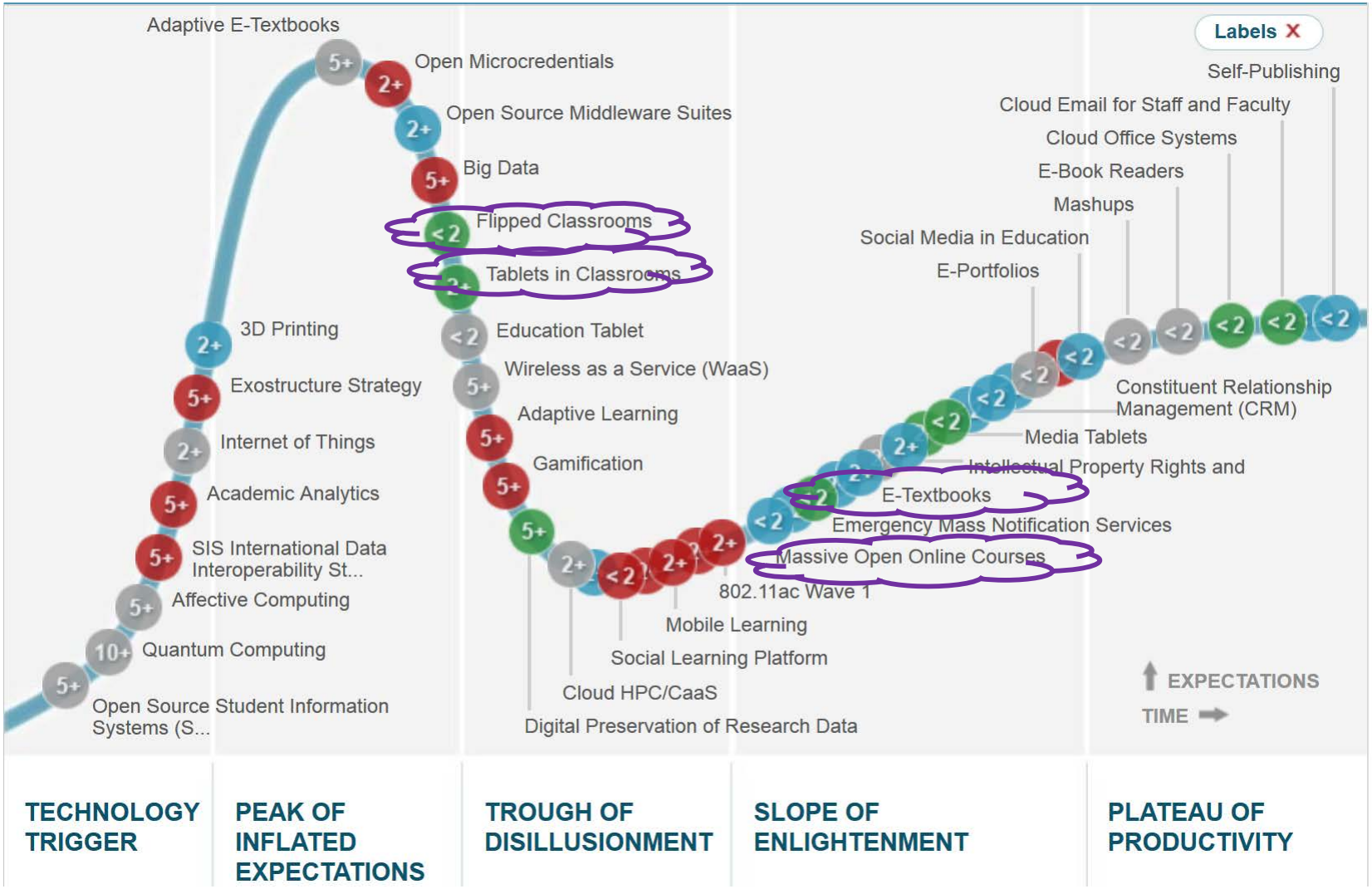


2 - 25 years

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

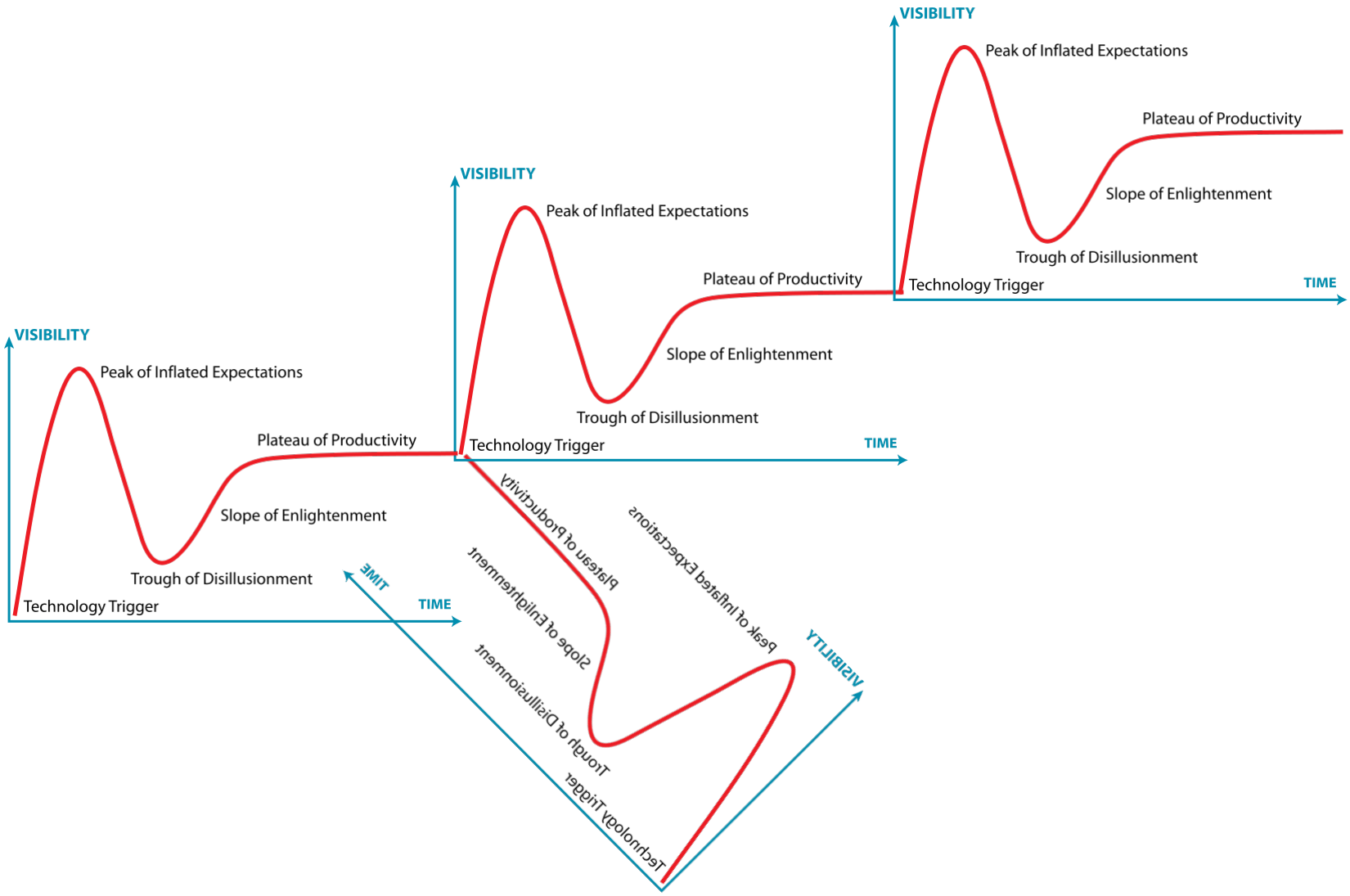
Technology, not pedagogy, triggers new cycles (according to Gartner)

The technology hype curve in education (for the year 2016)



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

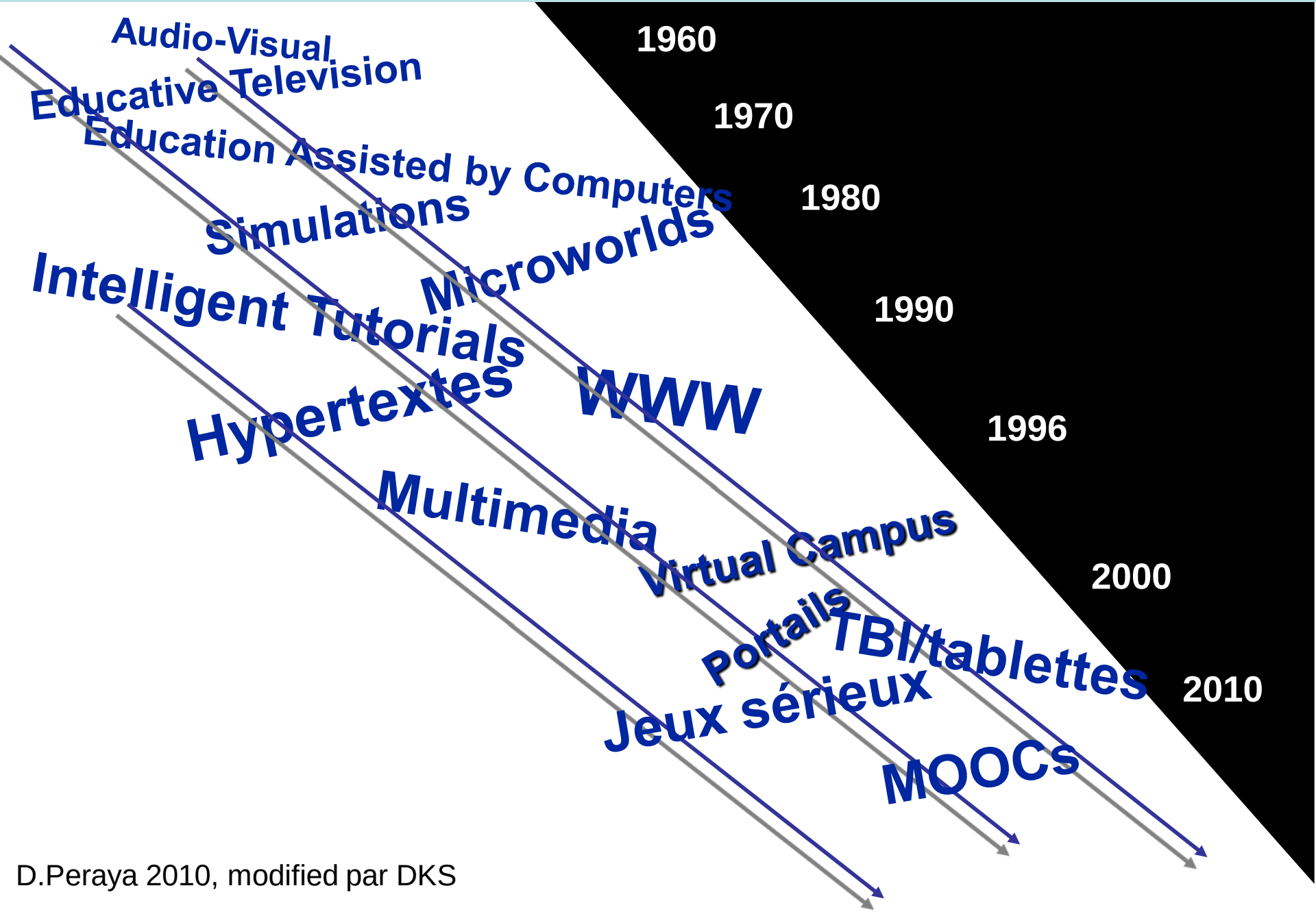
Where Gartner is wrong ….



Every 10-20 years there is a “restart”

Every 15 years a new dominant hype in an area of education

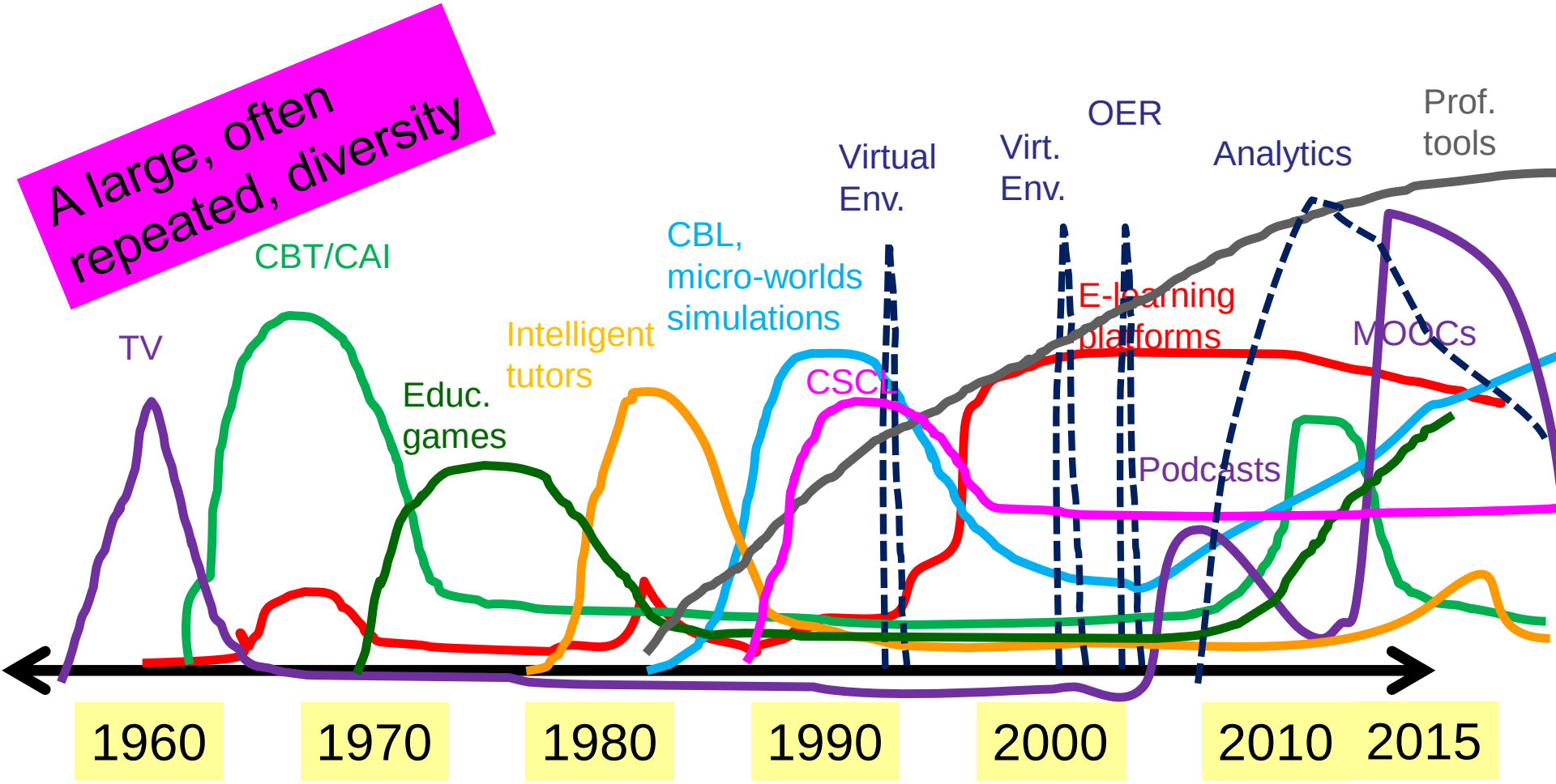
History of educational technologies (examples)



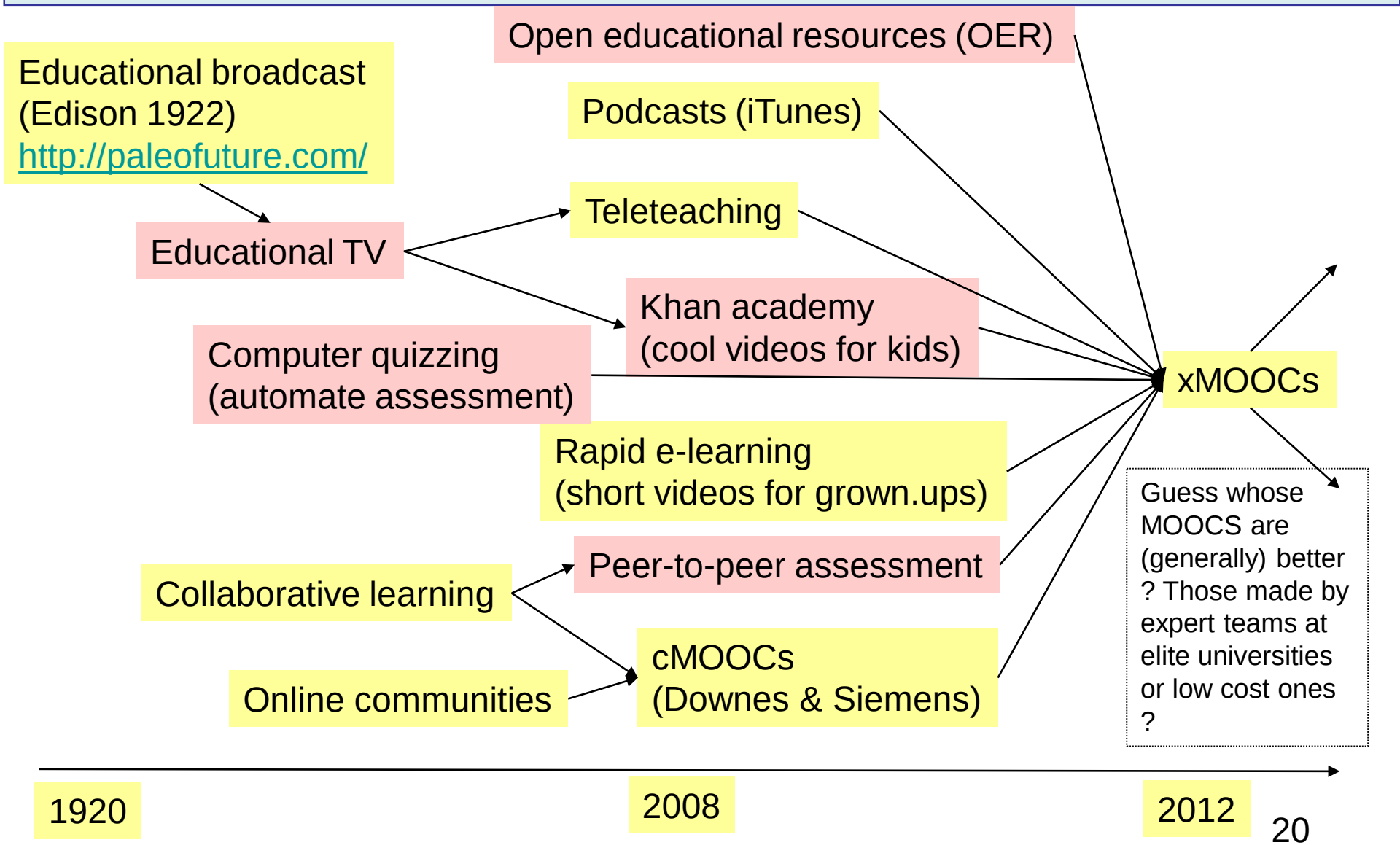
D.Peraya 2010, modified par DKS

E-learning – “Big inventions” about every 10-20 years

- New administrative structures are created, little communication
- New people enter the game, no understanding of basic principles
- Cycles (the «return of …»)



Example:
Sometimes change appears to be fast, but there is always a past !
The xMOOCs «tsunami» bundles other «innovations»…



Avoidable cost factor #1 – absence of historical thinking

1. Repetition without taking into account prior experience (e.g. podcasts, peer tutoring, quizzing in case of MOOCs)
2. Lack of knowledge transmission between generations (see above)
3. Lack of sound engineering principles (no clear identification of targets, no clear language, no reproducible designs, lack of documentation, etc.)

Cost reduction strategy #1 – design thinking

1. Look at past experience
2. Document technical and pedagogical designs and experiences
3. Do long term planning (15+ years for a single institution), learn from failure, imply all stakeholders
4. Do not just adopt a techno-pedagogy, because it is in the media (find very good rationales and align)

4. Educational & participation principles

(avoiding disaster)

The bottom line from many meta studies:

Learners need guidance and feedback

Task and activity-centered strategies give better results, but require “scripting”

Most learners need (formal) challenge

Quality is more important than type of design

Education is design for learning

First principles: what is good education ?

active and focused on tasks

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

Tutoring and «presence»

Good distance teaching (DT) performs as well as presence teaching

Drop out rates

- MOOCs: 95% (signed up people)
- DT with little tutoring and présence elements: 60-70 %
- DT with good tutoring and presence building: 10-40%
- Normal university teaching: 10-40 %

Distance teaching (DT) requires a tutoring structure and that participants have a sentiment of presence

If they are coached, tutored and feel being part of a «place» they engage more and more deeply.

Cost factor #2a – quality (not reducable)

1. Tutoring and coaching is required and cannot be compressed much
2. Learning activities must be well designed
   (a pure contents-based approach leads to failure)
3. (Development for mass education): materials must be well prepared

cost factor #2b – disasters (avoidable)

1. Ignorance of basic pedagogical principles
2. Illusion that cheap and quality mass education is possible
   (there are documented failures of would-be distance universitities, e.g.

Cost reduction strategy #2 – involve more people, invite all stakeholders

1. Evaluate cheaper ways of tutoring (e.g. peer tutoring, older students/experienced workers tutoring novices (give them credits, etc.)
2. Share creating materials, reuse other's materials
3. Use "de facto" or real standards and online collaboration for material production.
4. Avoid failure by respecting basic educational principles
5. (Small classes, workplace) Have learners contribute in various ways. Educate participating, reflective and active learners.
6. In organizations and enterprises, replace training courses by a general open learning and knowledge culture

4. Instructional design

Align:

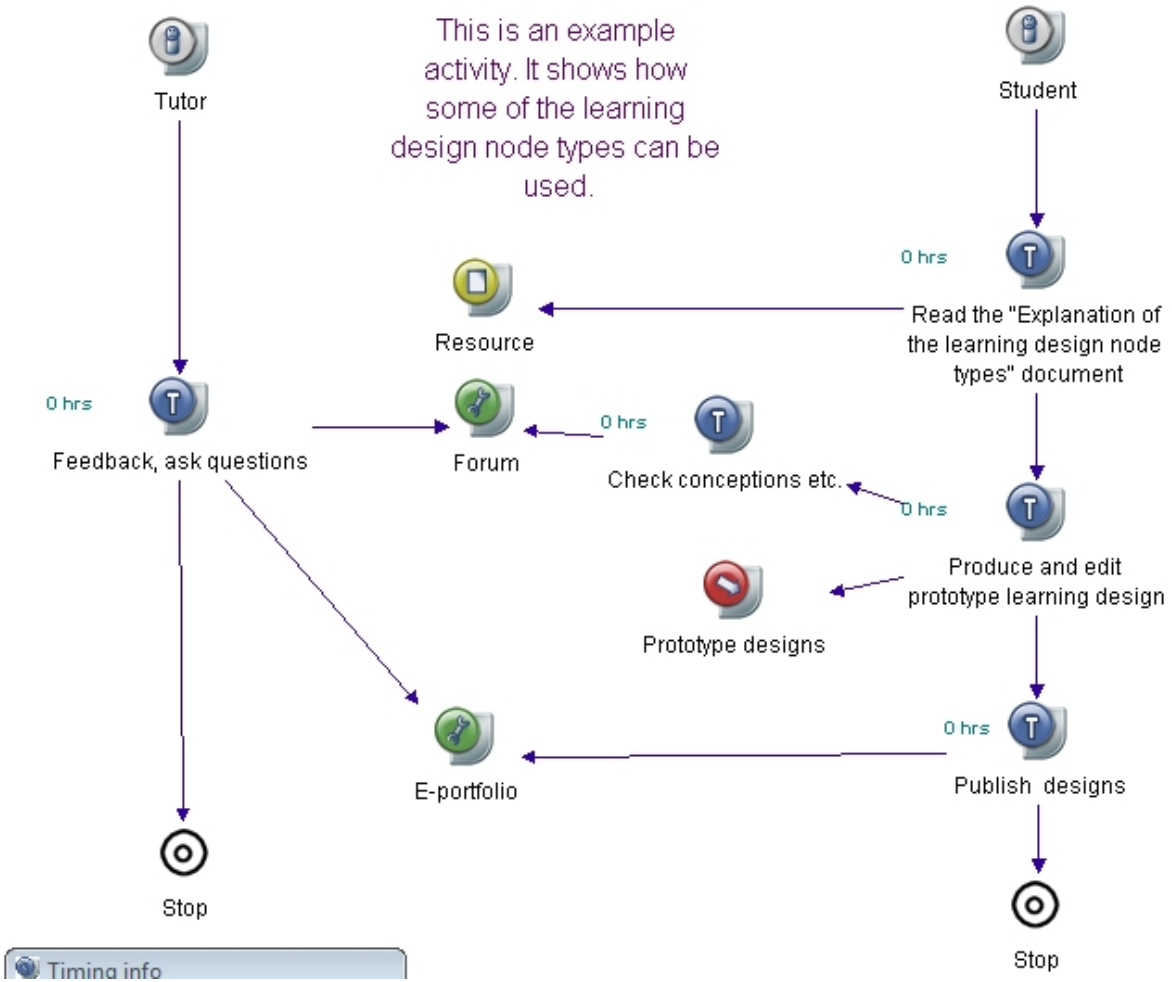
- Learning goals
- Pedagogy (strategy & tactics)
- Technology

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.

Educational scenarios (learning designs)

- Who does what and when, using tools and resources ?

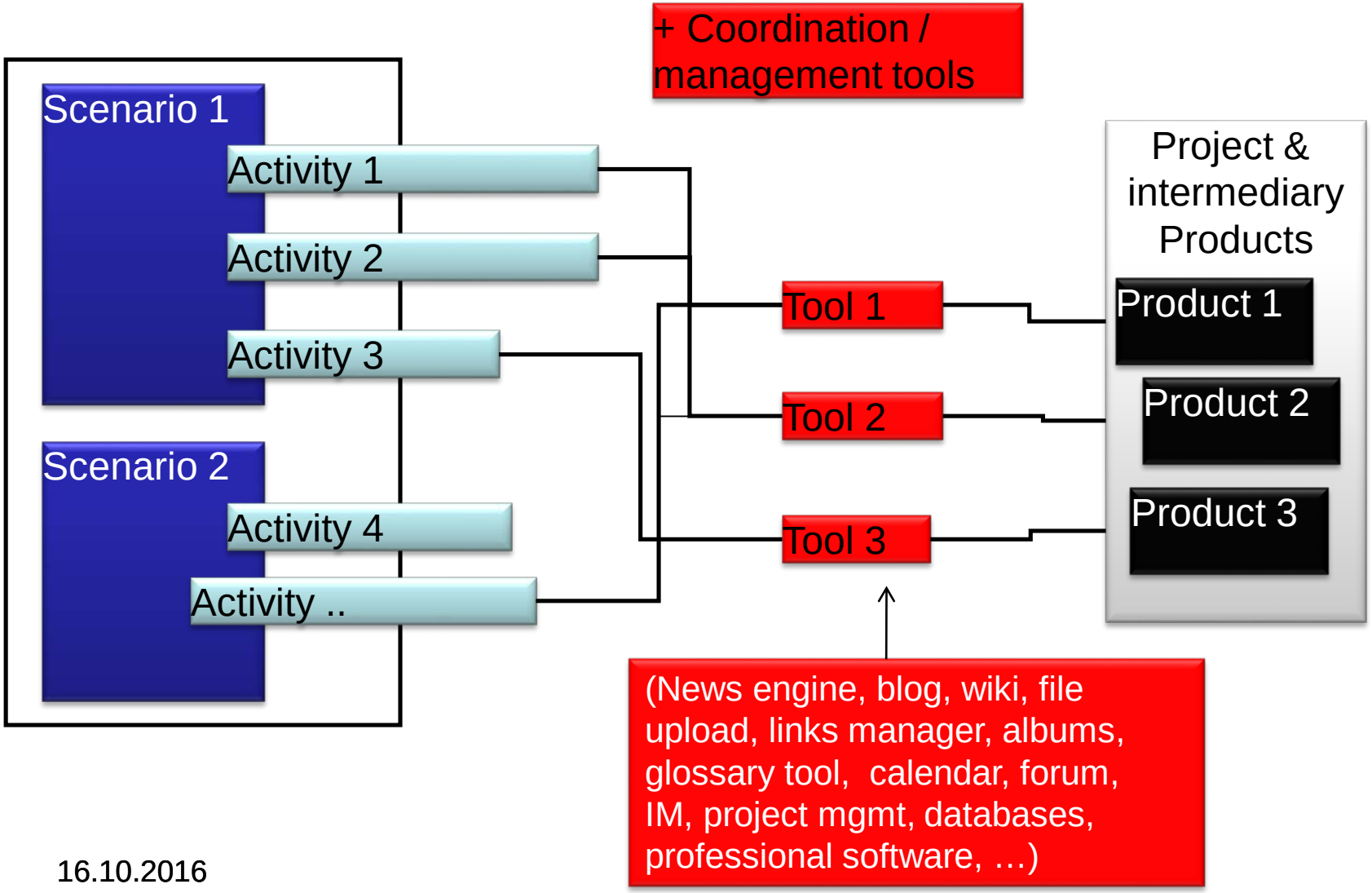


Strategies & tactics made operational

Back to tools ….

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

Your learning management platform may be deficient: use external tools



Pedagogies and choice of technologies

Dominant pedagogic strategy	Transfer (learning I)	Tutoring (learning II)	Coaching (learning III)
Technology	Learning Management System (LMS) Multimedia presentations and quizzing CBT Screencasts MOOCs ….	LMS (Instructions, files and forums) Guides simulations/ serious games Groupware Real-time conferencing …..	Social platforms Co-production platforms (e.g. wikis, github) E-portfolios

Cost factor #3 – design quality (can be done more efficiently)

Good e-learning:

- Aligns goals with appropriate pedagogical strategy and tactics
- Includes active learning

Good e-learning technology:

- supports educational tactics with appropriate tools

Cost reduction strategy #3 – Use/create a small set of successful instructional designs that is approved by all major stakeholders and chose appropriate tech

Strategy examples:

1. In mass education: Gagne's 9 events of instruction
2. In free open education: Short videos, OER, peer tutoring
3. In engineering: project-based learning
4. In medical education: problem-based learning
5. In management: case-based learning
6. In biology: inquiry learning
7. In vocational training: Simulations (serious games)
8. In companies: Think community-based open learning as complement to screencasting and role playing games

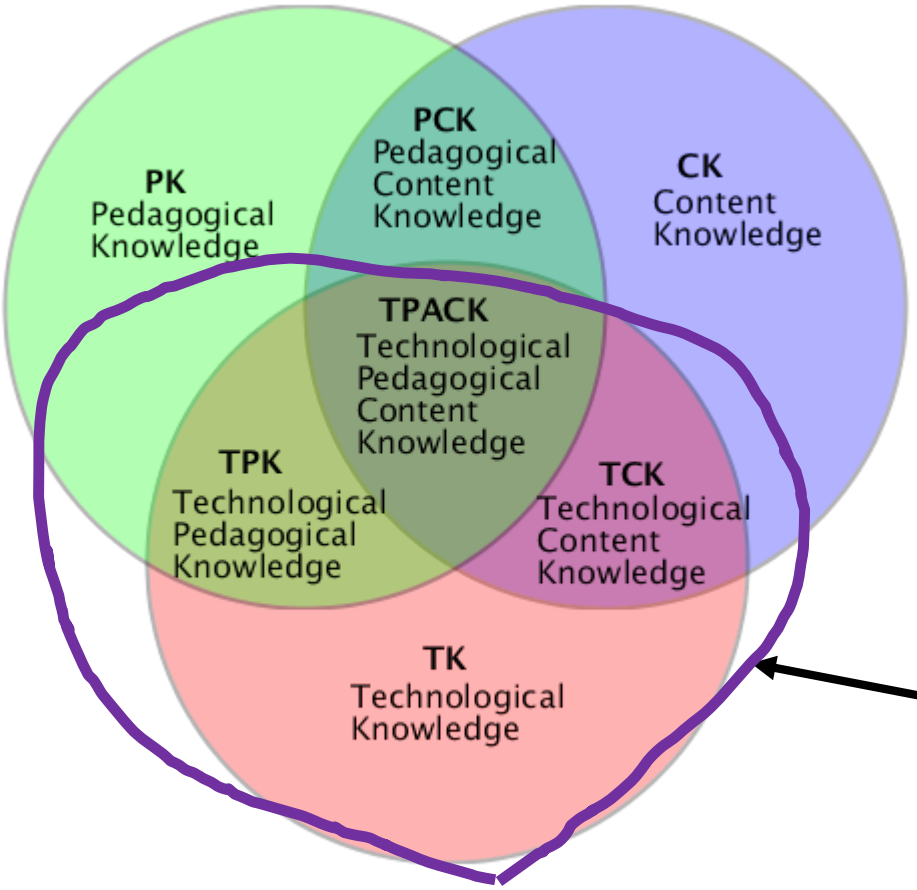
And train to use these (see next chapter!)

Use:

- Good agile design languages
- Activity-based scenarios
- Other than e-learning tools (often more stable and useful)
- Some project-oriented or apprenticeship designs require less development

5. E-learning competency

Teachers should be trained in using techology for education



Dimensions of teacher skills …

TPACK => be able to create technology enhanced teaching designs
(Koehler & Mishra)

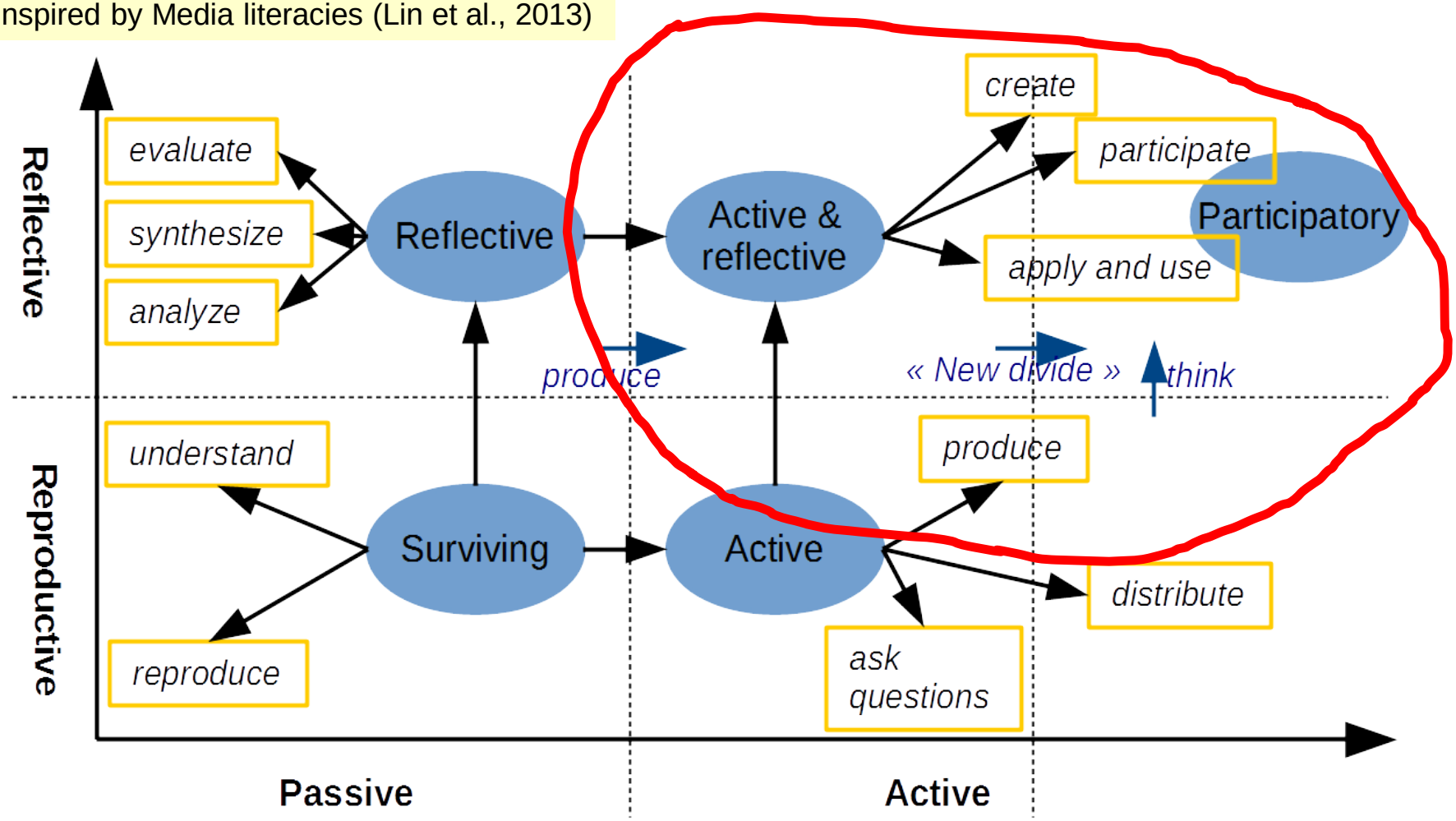
Train teachers, create a mentoring program
(long term gain)

The TPACK framework

Hidden teacher development costs are vastly underestimated and contribute to disasters

6 stages development model

Inspired by Media literacies (Lin et al., 2013)



Cost reduction strategy #4:
Active and reflective learners needs less support and less structured materials. They even will help with development, tutoring and coaching.

5. E-learning and pedagogic change ?

Change method and time needed (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

A last slide …

Some ideas seen in this talk

- Plan and design using light & serious tools
- Have learners contribute (materials, tutoring)
- Reuse other resources
- Peer-tutoring / commenting
- Train teachers (and other personnel) and give them time

Others !

- Automatize what can be automatized
- Use standards
- …..
- Focus development on difficult matters
- Repurpose domain tools, e.g. engineering software, online word processors, ….

http://edutechwiki.unige.ch/en/

Merci

Questions ?
Comments ?

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