New technologies for new practises in methodology teaching ?

Colloque

Relier et valoriser les données
De nouvelles bases pour la statistique et les sciences sociales

Berne, May 9 2003

Daniel K. Schneider

http://tecfa.unige.ch/tecfa-people/schneider.html

TECFA

Faculté de Psychologie et des Sciences de l'Education
Université de Genève

Code: bern-2003

Goal of this talk

New pedagogics

New tools (Internet)

Setups for life-long learning

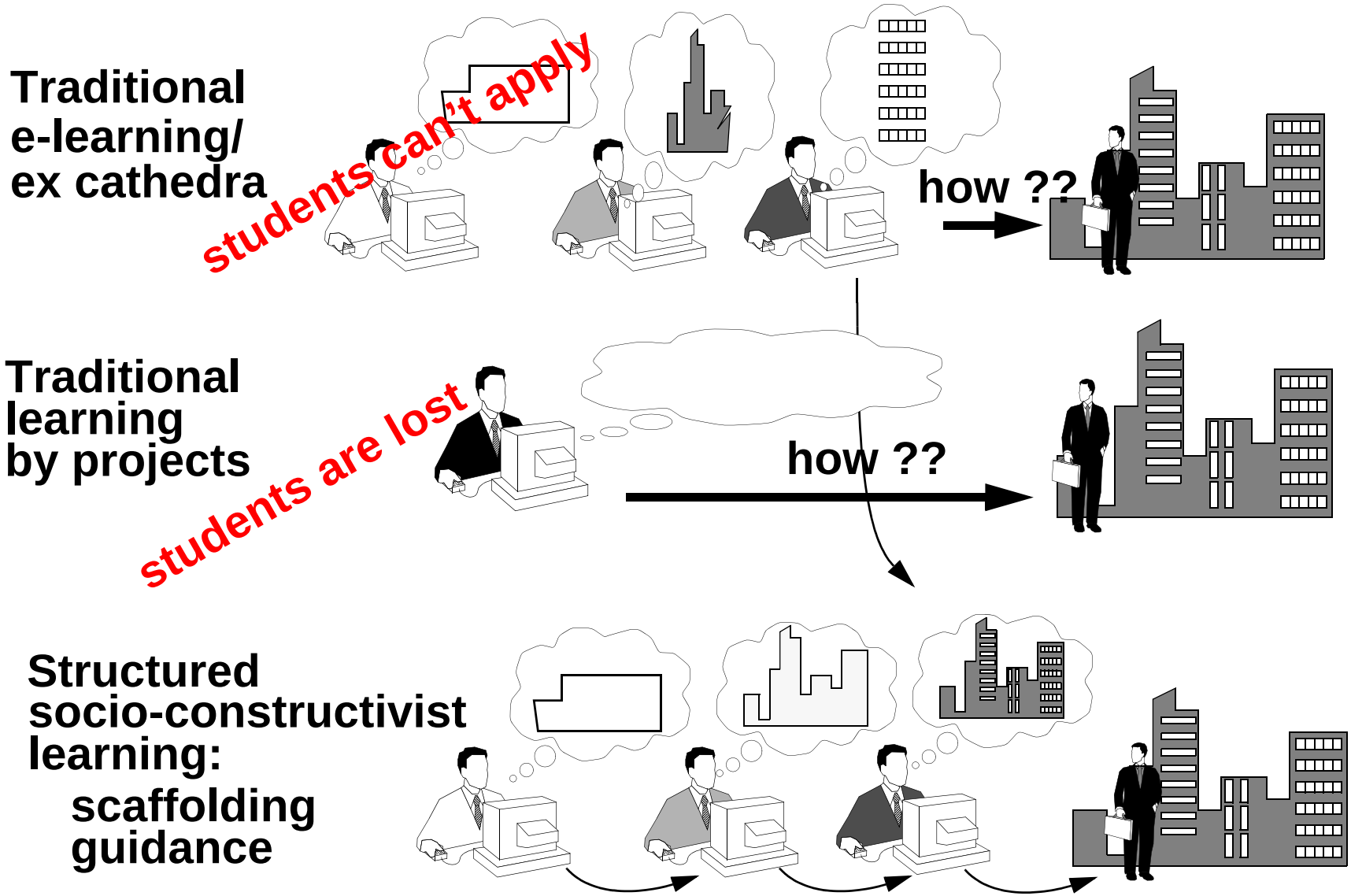
Menu of this talk

1. The big issues 4
2. New project-based pedagogics 7
3. Case study #1: Blended project-based teaching 11
4. Case study #2: games and programming 20
5. What's the difference again ? 21
6. Design of learning environments (LE) 24
7. Life-long methodology teaching: now what ? 30
8. Endnote: See the SEED project 34

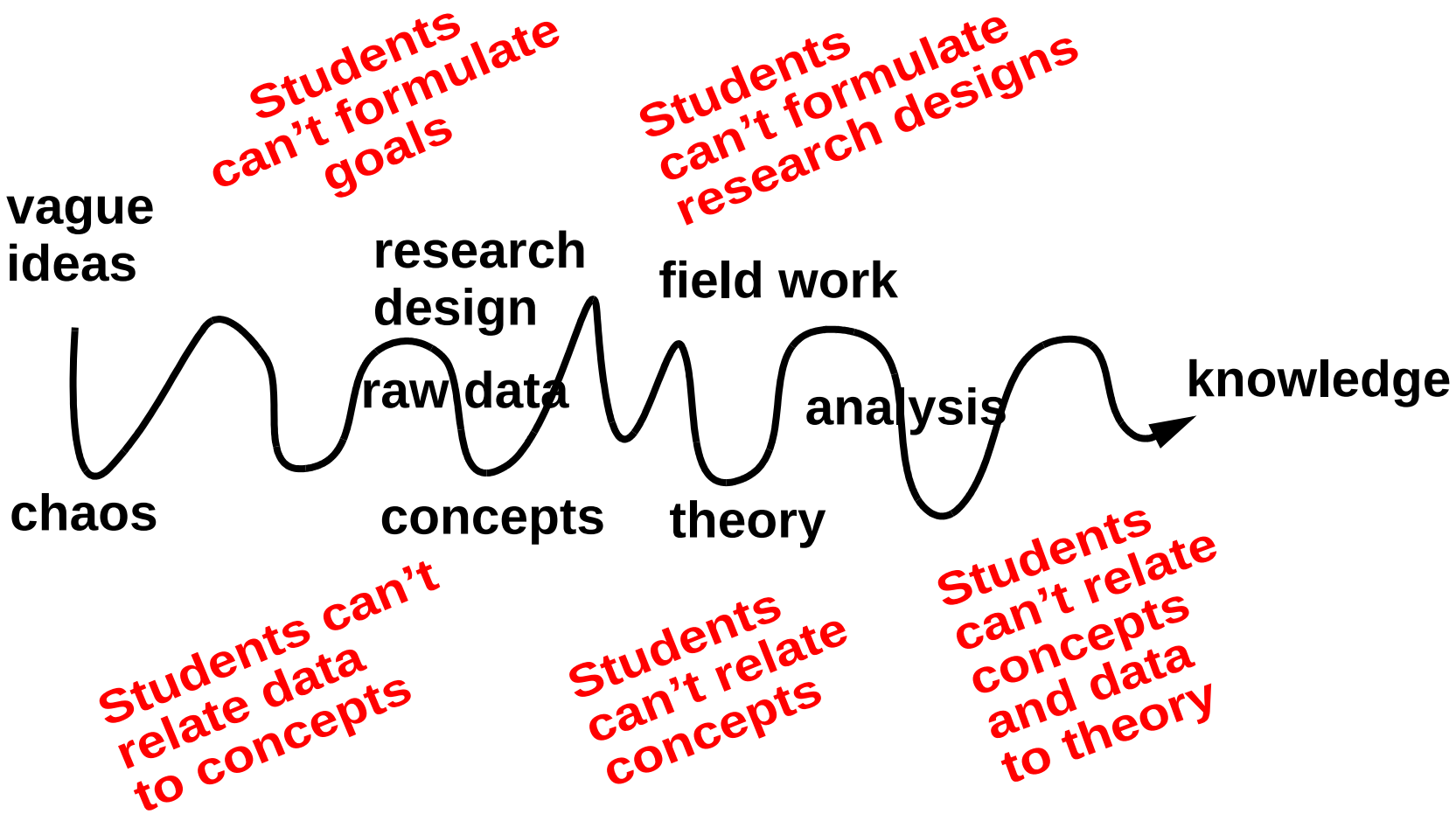
1. The big issues

Problems	*Solutions ?*
Students can't apply what they have "learnt", can't put things together	**project-oriented teaching *(pedagogical reform)***
Students are not trained or expected to do research	
Students are not motivated to learn "abstract" methodology	**"just in time learning" *(learning on demand)***
Methodology is a too large field	

1.1.The issue of knowledge Transfer



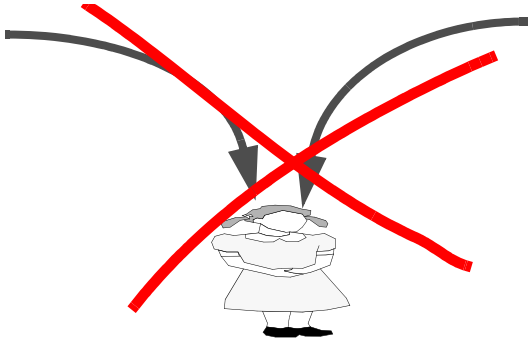
1.2.The difficulty of doing a project



2. New project-based pedagogics

2.1 Principles:

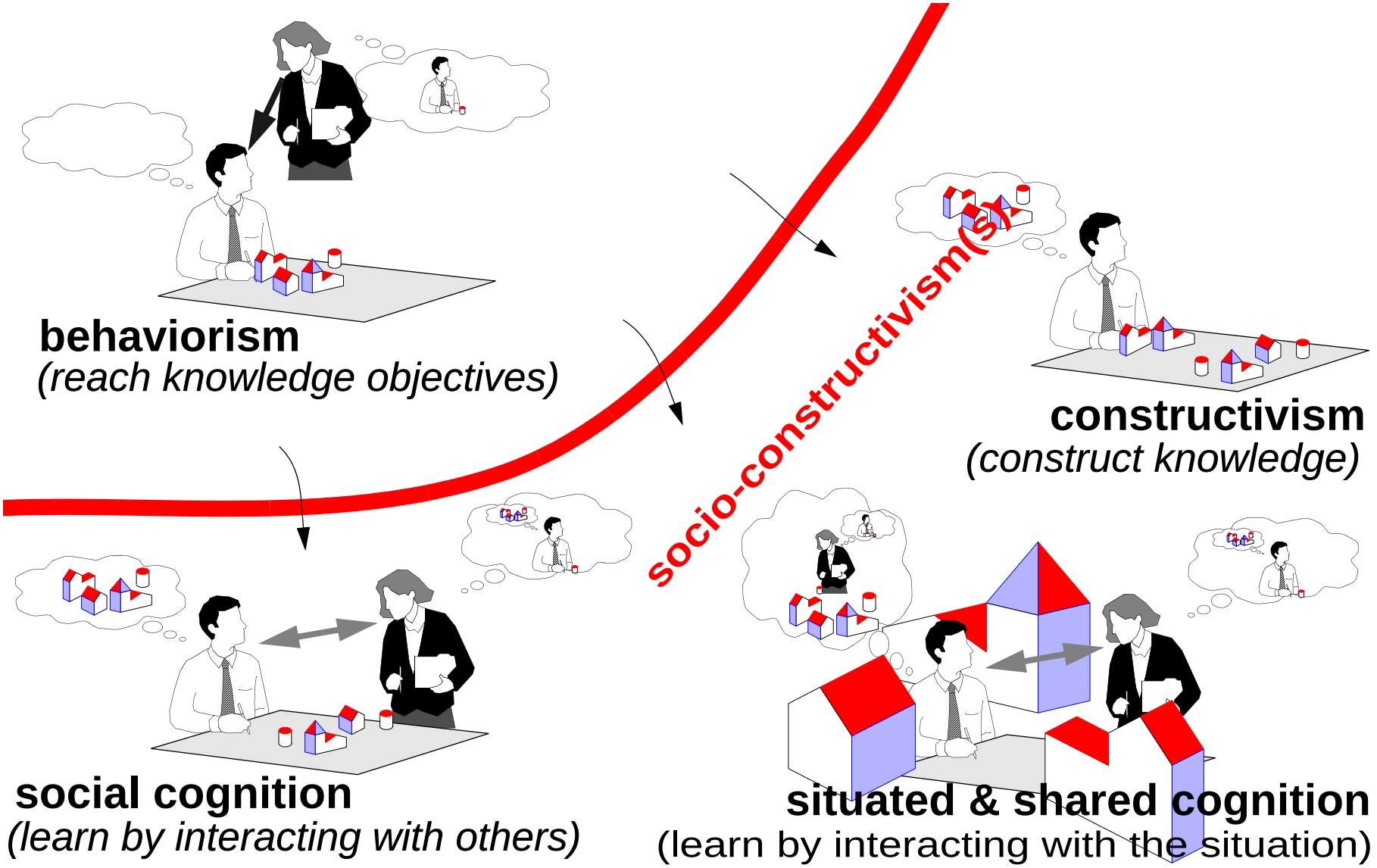
- **learning and teaching is a complex whole and not limited to content transfer (basic knowledge)**



- **authentic & project-based pedagogical scenarios (real data & real problems)**
- **technology can help ...**

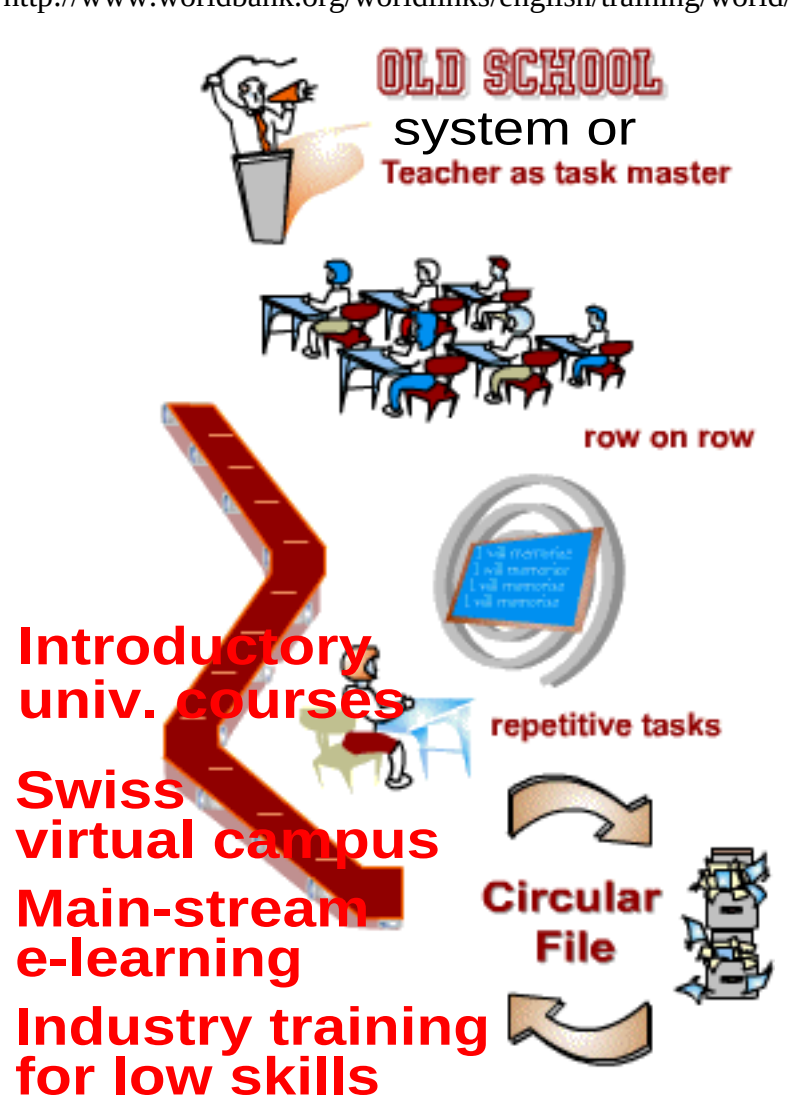
.... let’s look at some details ...

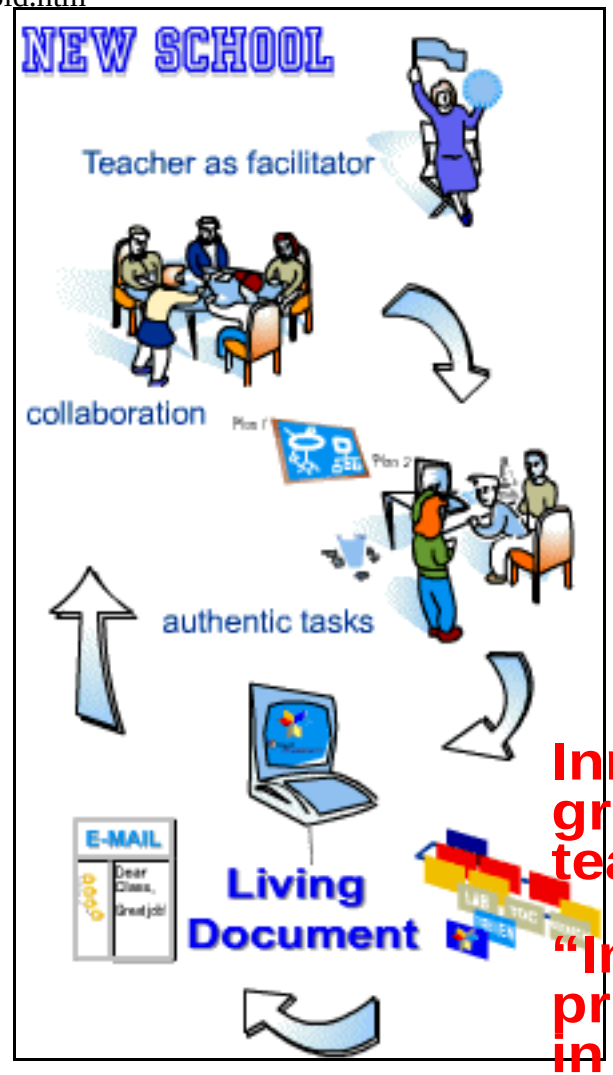
2.2.Basic knowledge vs. applicable knowledge



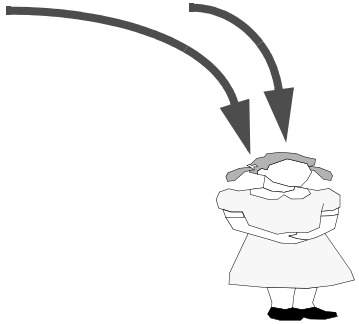
2.3.“Old” school vs. “new school”

http://www.worldbank.org/worldlinks/english/training/world/pbl/newold.htm





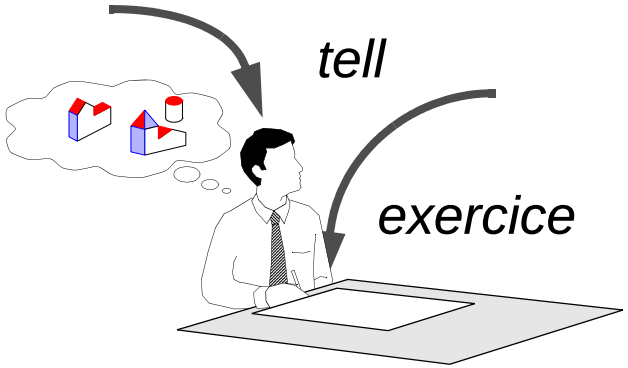
2.4.Current methods and tools for distributed learning



listen
look at multi-media
surf on the Web

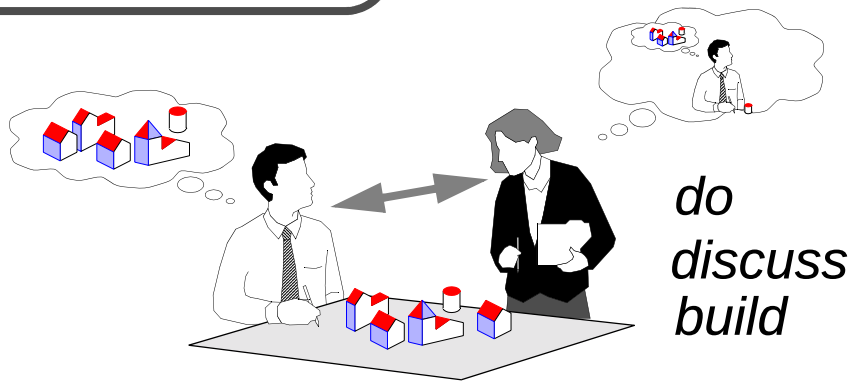
bad content transmission:

web pages / videos



good content transmission: instructional pedagogies

“Learning Management Systems”

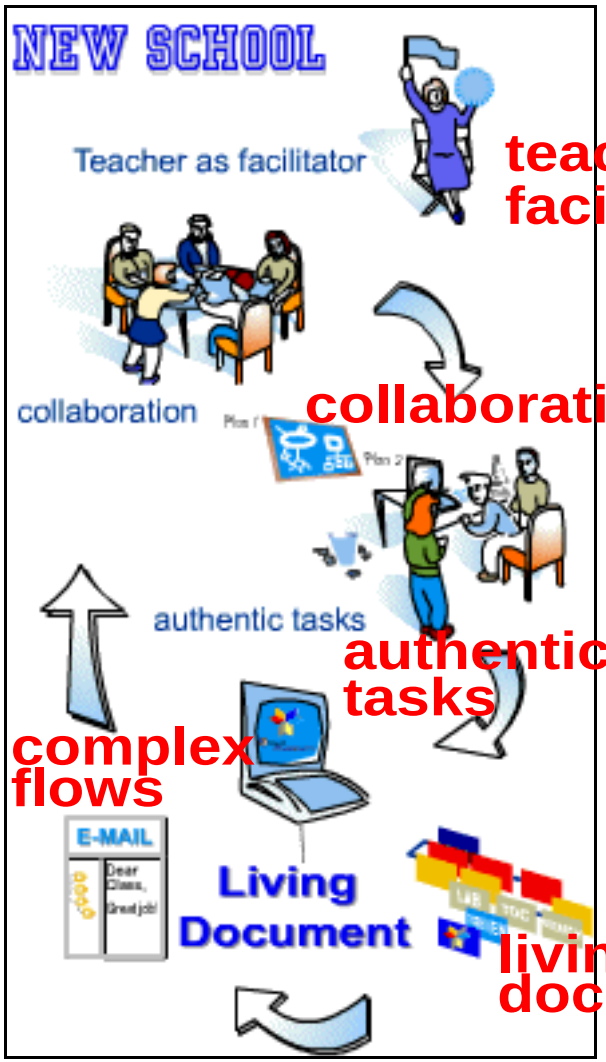


do
discuss
build

socio-constructivist pedagogies:

Several Internet Tools or Activity/community Portals

3. Case study #1: Blended project-based teaching



teacher as facilitator

collaboration

authentic tasks

complex flows

living documents

Minimal (!) tool requirements:

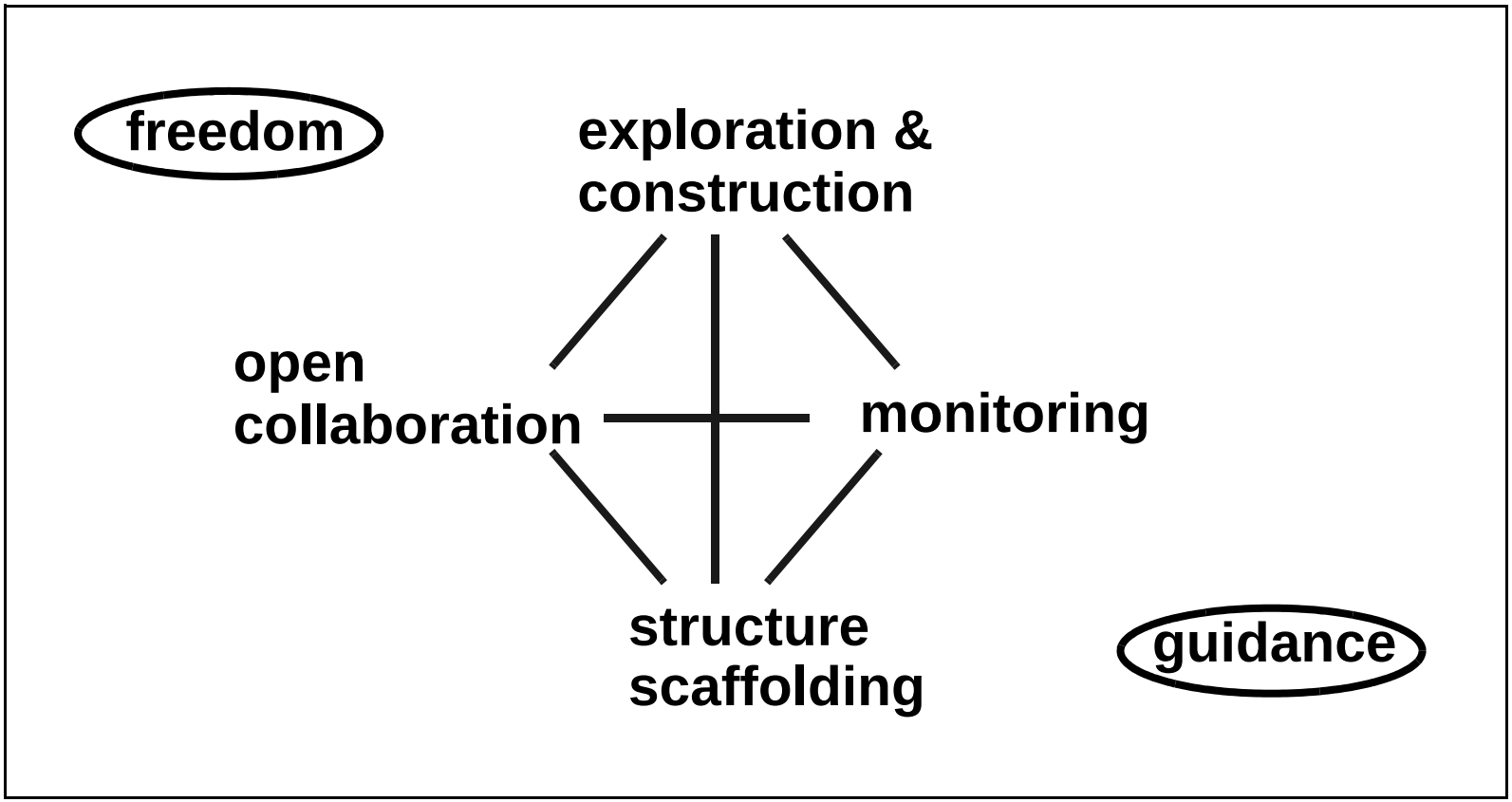
Content & knowledge management
Document & knowledge exchange
Project management support
Community management
work tools (if needed)

... more

"blended"=mixed distance/presence teaching

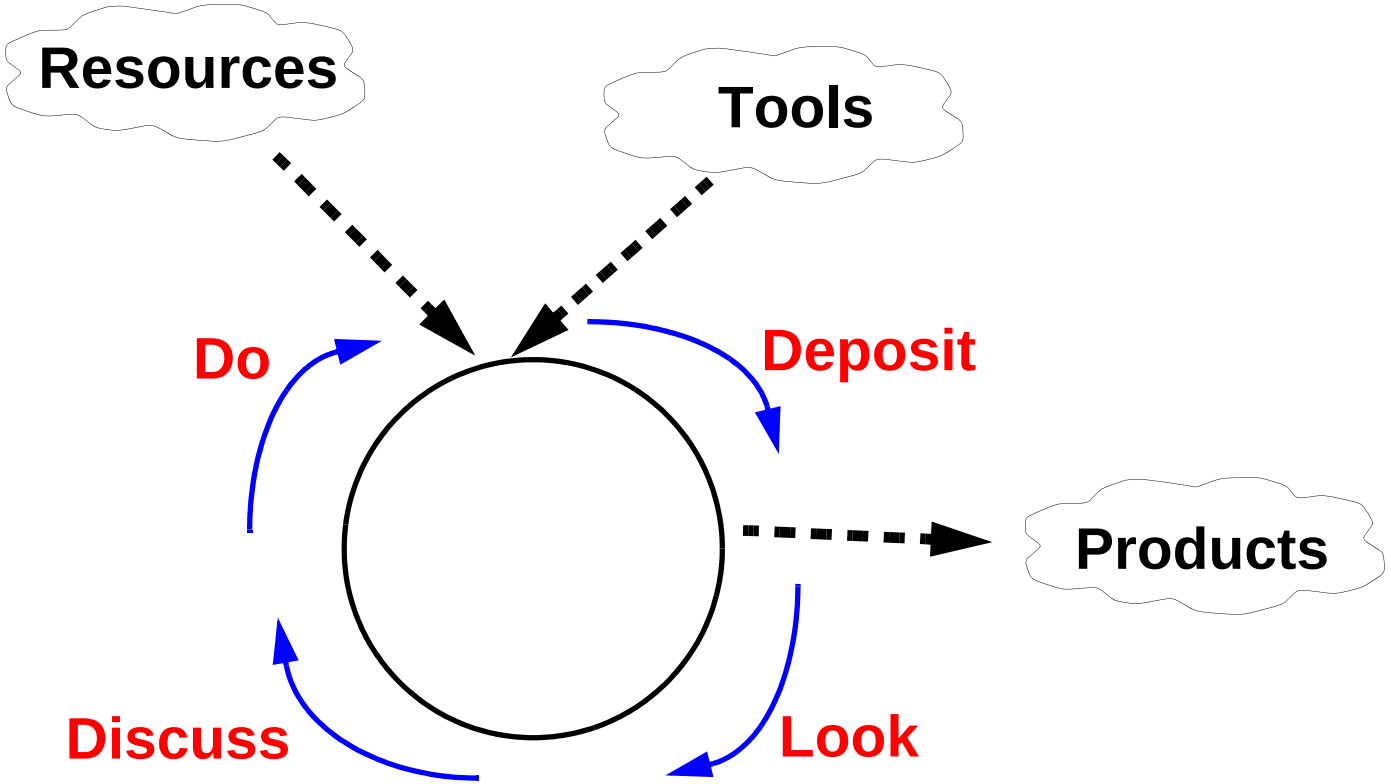
3.1.Use of structured pedagogical scenarios

- **"Open" pedagogical designs are more effective if individuals and groups have to evolve within *somewhat* specified scenarios**



... we need to orchestrate somewhat

- **Scenarios are sequences of activity phases within which group members do tasks and play specific roles**
- **This *orchestration* implies organizing workflow loops**



... this is just the (abstract) “ur-loop” ... hold on !

3.2.The computer in a socio-constructivist perspective

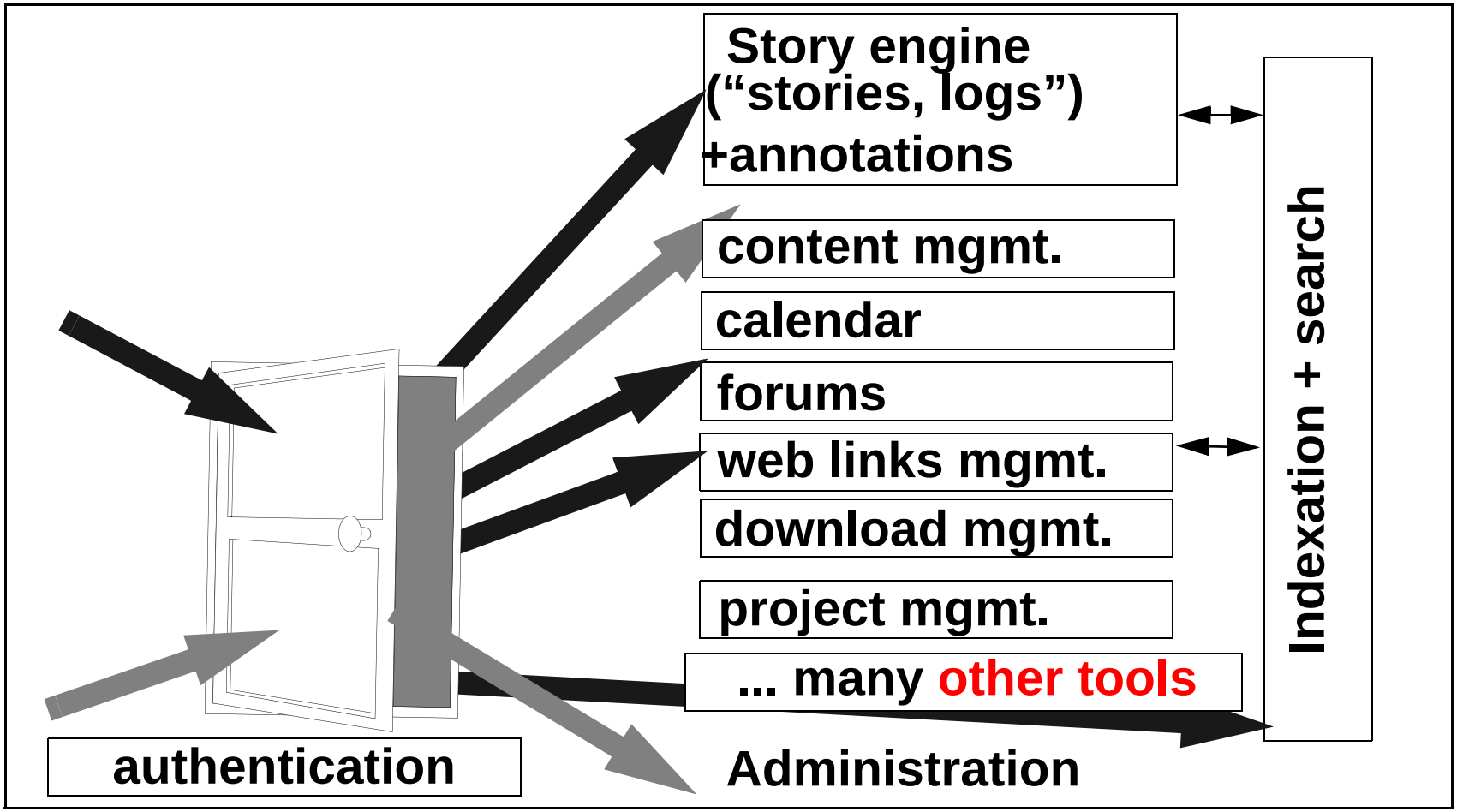
- **the computer is merely a facilitating structure, a thinking, working & communication tool**

Elements	*teacher (manager)*	*learner (worker)*	*computer (tool)*	*designer (resource)*
Goal setting	helps or defines	defines or refines	provides tools	provides ideas & half-baked models
planning	suggests & controls	does		
monitoring	audits & helps on demand	self-observation, diaries		observes
contents	suggests, produces	uses & produces (!)	storage, search & awareness tools...	can provide & develop
tools	configures, helps	selects, learns, uses	provides work tools offers reflection	
community	participates	participates	is environment	suggests

- **Most student and teacher activities should be supported by computational tools and lead to new "contents"**

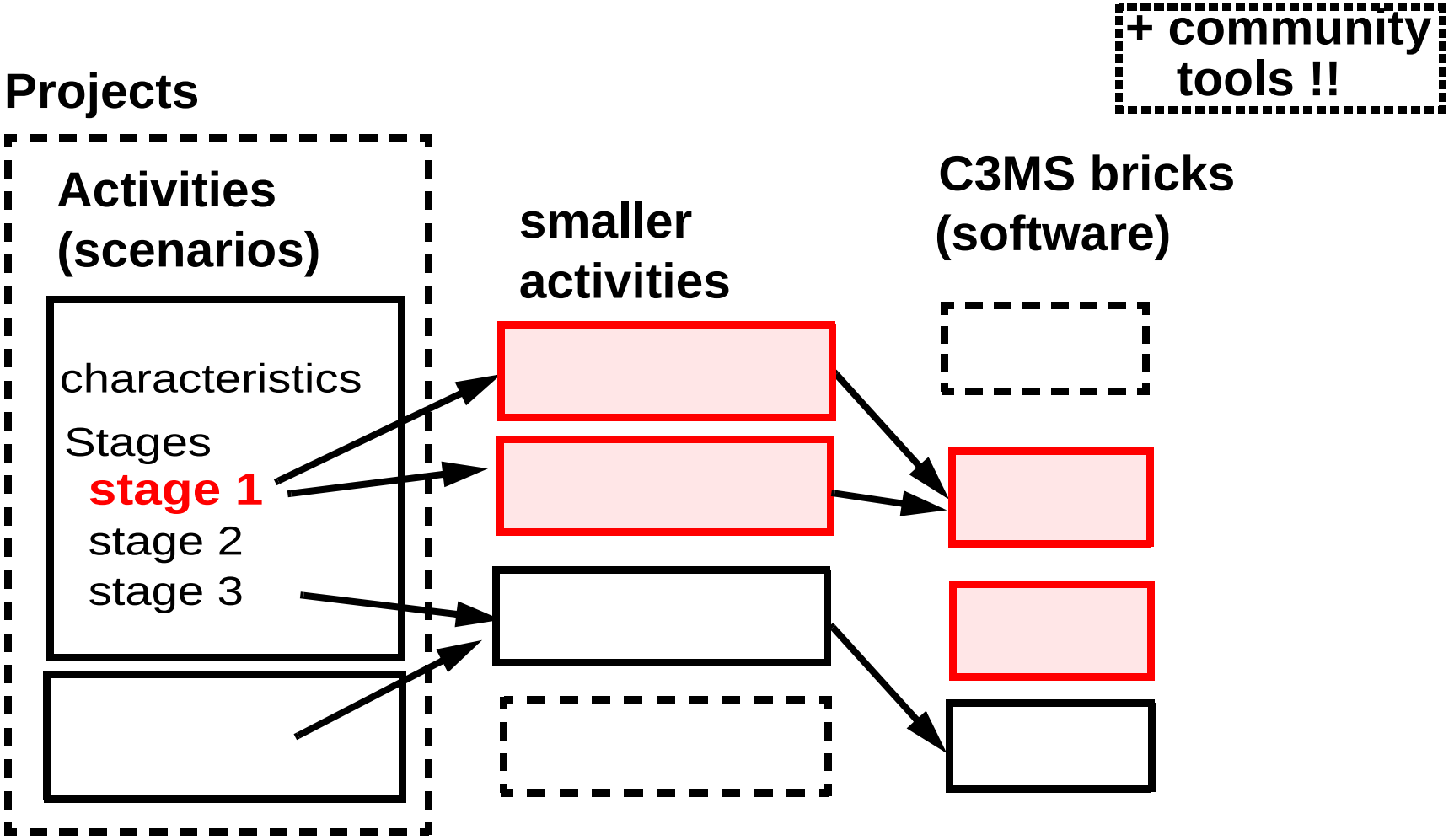
3.3.Use of C3MS Portals

Community, *Content*, & *Collaboration* *Management* *Systems*

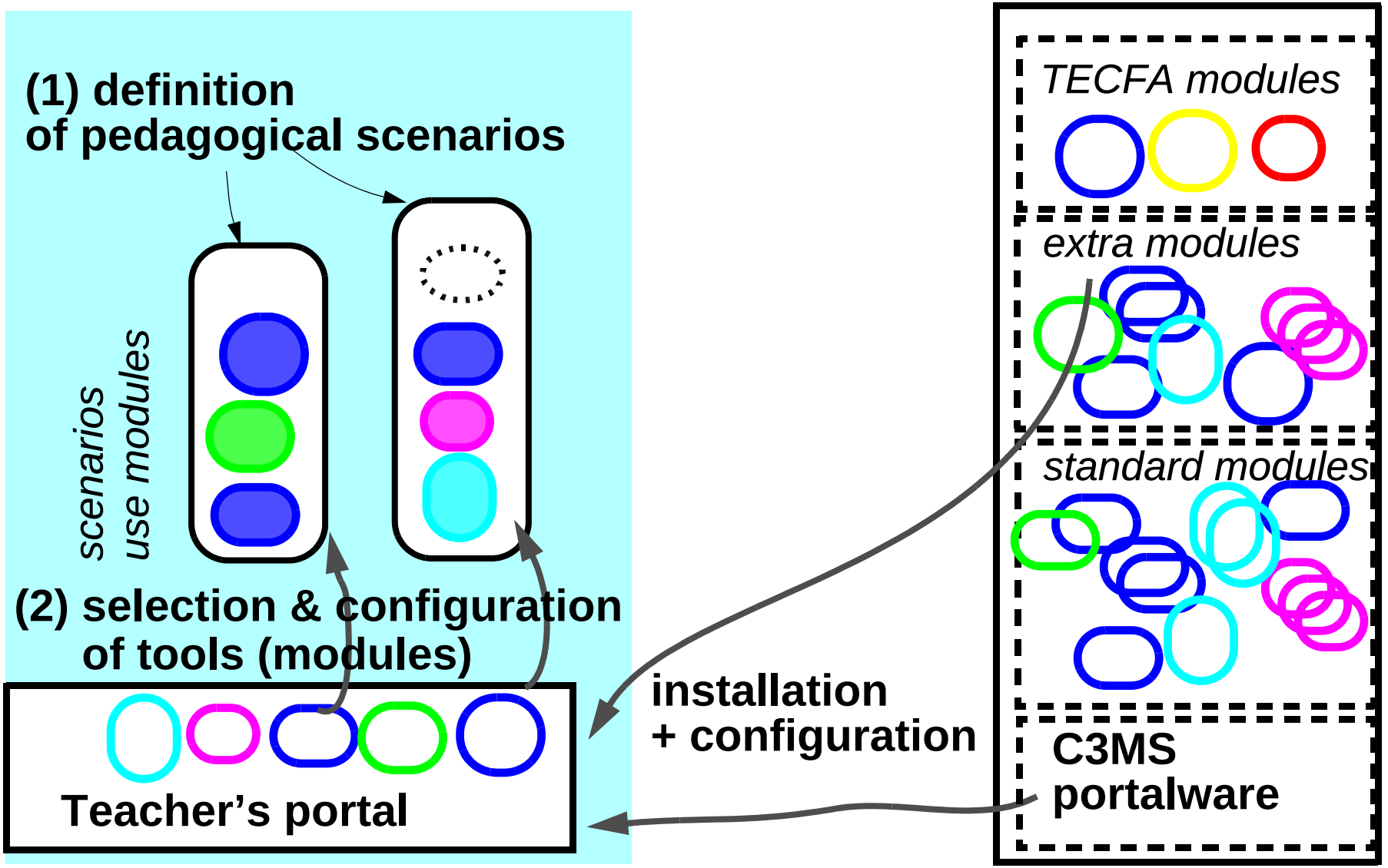


- ***Integration*** **of most applications (authentication, interfaces,...)**
- ***Plug-in architecture*** **! (YOUR organization can write modules)**

3.4 C3MS portals + educational scenario scripting



3.5.Teacher “scripts” flexible project scenarios



3.6 Example: “Staf18” course @ Tecfa

Blended (mixed presence/distance) format

- **duration: 6 weeks (a few initial half days in classroom)**
- **2 hours presentation at the end of the course**
- **public: graduate students in educational technology (different backgrounds and age)**

Project-based

- **large freedom for choice of subjects within the general theme**
- **requirements: research plan, respect of task schedules**
- **some mandatory collective work**

Theme 2002/3: “Exotic hypertexts”

- **New languages (e.g. Topic Maps, RDF/RSS), Wikis, MOOs, etc.**
- **Build a system or do empirical research and write a paper**

	Major activity phases	*Date*	*software tools*
1	**Look at subject**	21-NOV-2002	**links, wiki (coll. hypertext), weblog**
2	**project ideas, Q&R**	29-NOV-2002	**classroom**
3	**Initial project ideas**	02-DEC-2002	**news engine, weblog**
4	**Start project definition**	05-DEC-2002	**ePBL (proj. mgmt), weblog**
5	**provisional research plan**	06-DEC-2002	**ePBL, weblog**
6	**Finish research plan**	11-DEC-2002	**ePBL, weblog**
7	**Sharing**	17-DEC-2002	**links, weblog, annotation**
8	**audit**	20-DEC-2002	**ePBL, weblog**
9	**audit**	10-JAN-2003	**ePBL, weblog, news engine**
10	**Finish paper and product**	16-JAN-2003	**ePBL, weblog**
11	**Presentation of work**	16-JAN-2003	**classroom**

In **ADDITION**: shoutbox, links manager, news feeds from other portals, wiki (collective hypertext), various forums, articles, annotations, calendar, awareness tools (who is here, what is new) + **external tools**

4. Case study #2: games and programming

- In both situation, user involvement can be very high
- both are not very good metaphors for pedagogics
  - games are made for entertainment
  - before one can program, one needs to learn a lot ...
- ... but we can learn about motivational features ....

Elements of interest to education	*gaming activities*	*programming activities*
imagination	X	x
network of goals	x	x
feedback	X	x
“right” challenge	X	x
community	x	x

5. What's the difference again ?

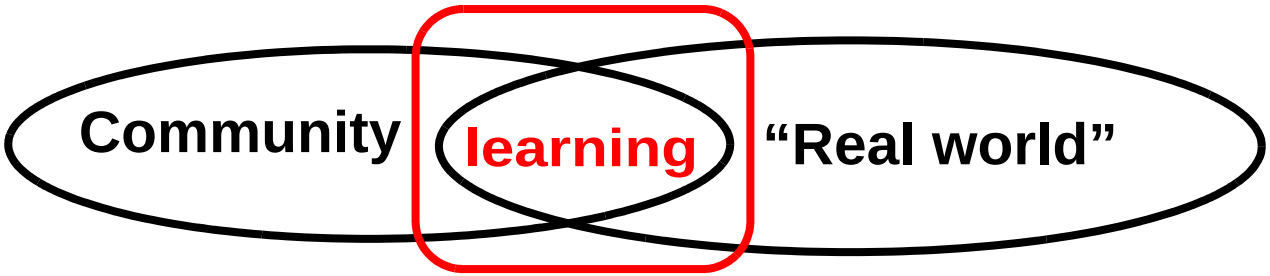
	Project-based e-learning *"new school"*	*Main-stream e-learning* *"old school"*
Activity-based	***yes***	***little***
Authenticity / embeddedness	***yes***	***little***
Community	***yes***	***little***
Creativity	***yes***	***little***
Contents	***little***	***yes***

... let's now discuss community & creativity

5.1.Learning within a community and within context

A sampler of arguments:

- **members of a community tend to make better progress (peer intellectual & emotional help and mutual stimulation)**
- **some goals can't be reached alone (distributed cognition)**
- **a group can develop special language and practice adapted to specific problems**
- **knowledge through enculturation (collective memory)**
- **cognition is tied to experience (grounded)**
- **communities can extend beyond formal groups of learners**
- **a lot of learning is informal**
- **good communities are knowledge management aware**



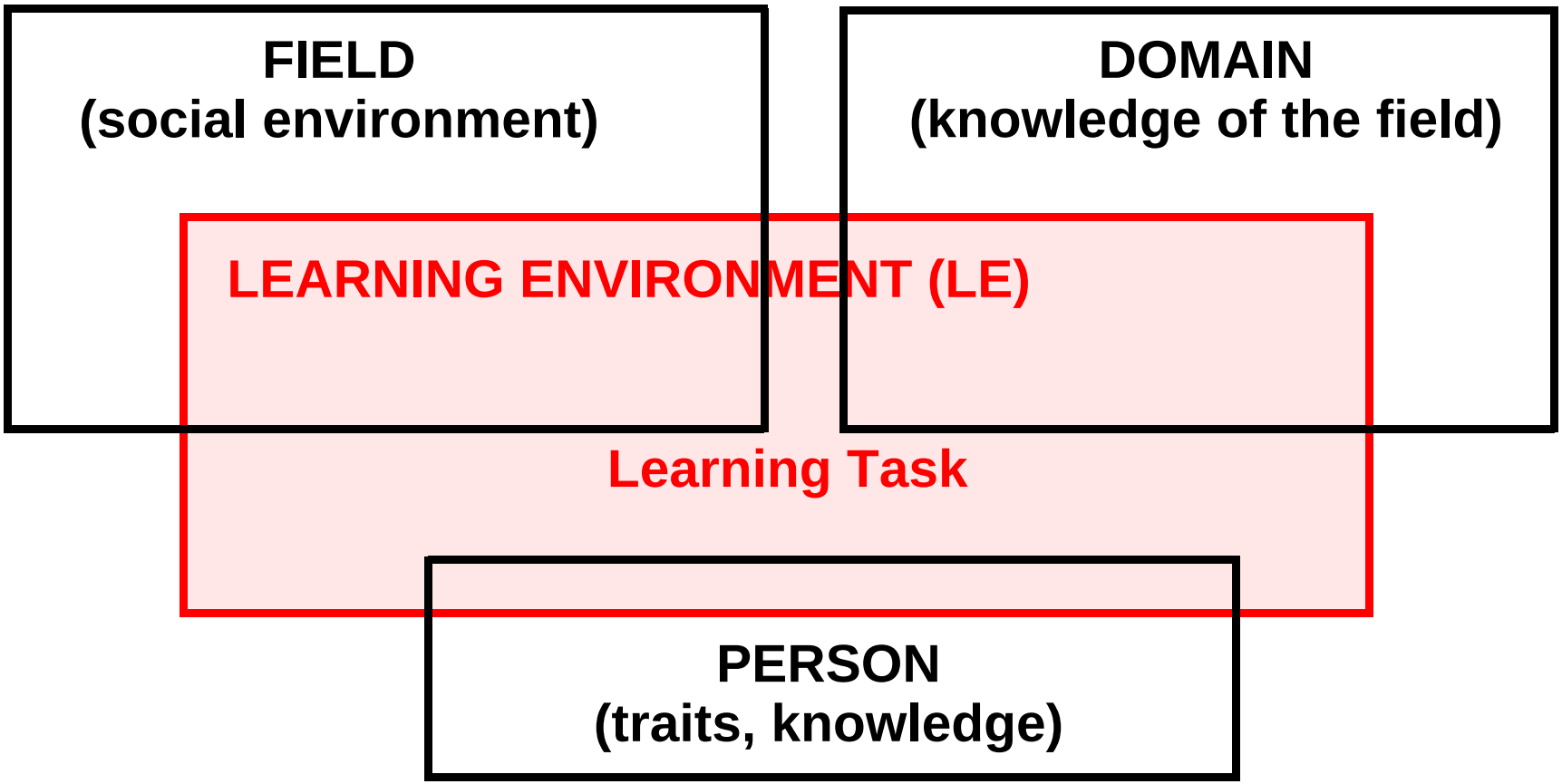
5.2.Important creativity variables

Analysis level	*Main variables of interest*
Intellectual traits:	• e.g. fluency of ideas, flexibility in thinking, increased reflectiveness
Personality traits:	• e.g. sensitivity to environment, preference for complexity, intrinsic motivation, self-control, balance between new and old...
Cognitive structures:	• expertise of some domain, "networks of enterprise" (goals, projects, etc.), scope, ...
Domain Environment:	• domains (symbol systems) into which possibilities can be introduced.
Field environment	• network of people, support, instruction, evaluation, recognition, cognitive and affective support, ...

Some of this can be conditioned ...

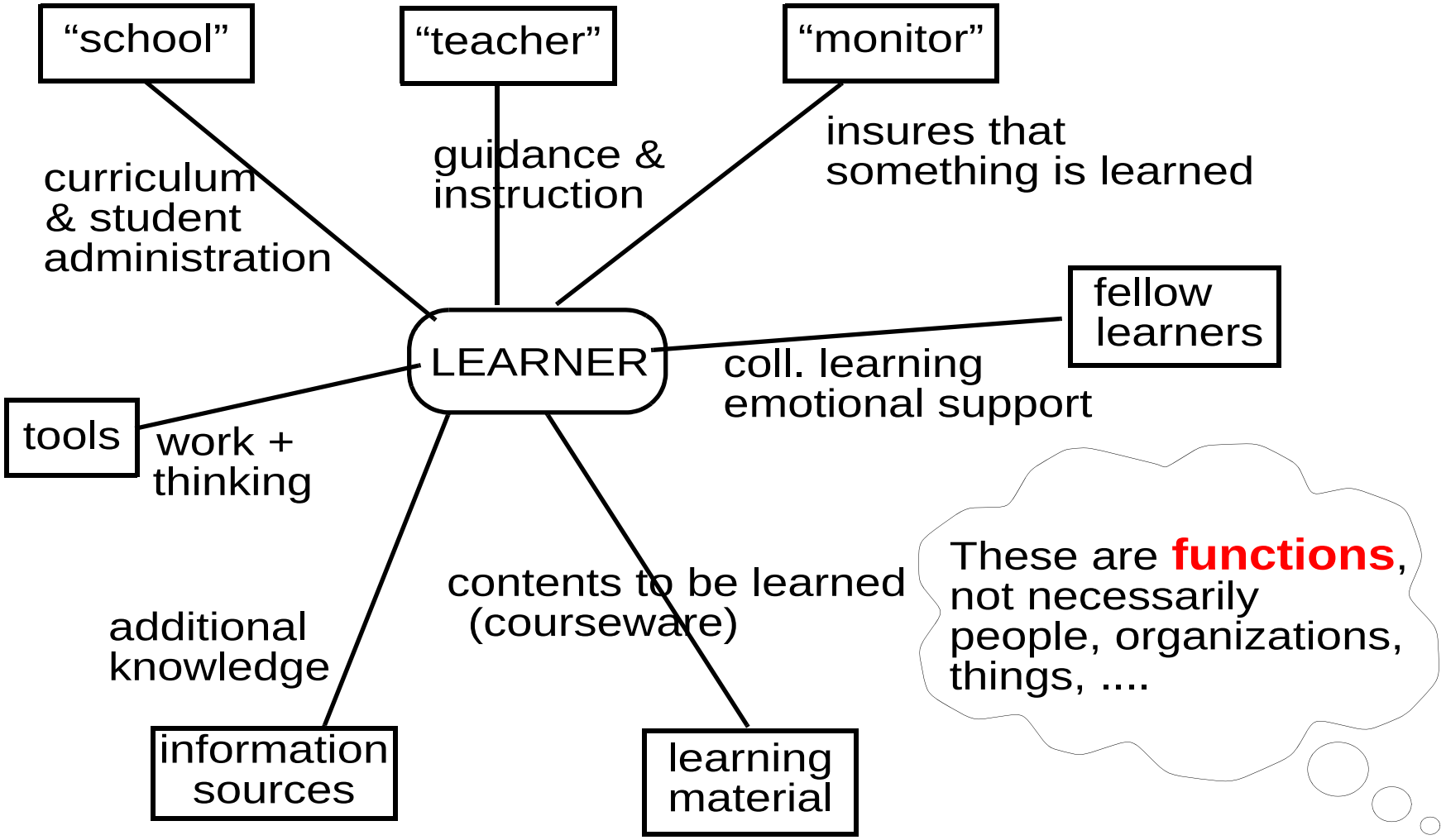
6. Design of learning environments (LE)

6.1 Input from creativity research



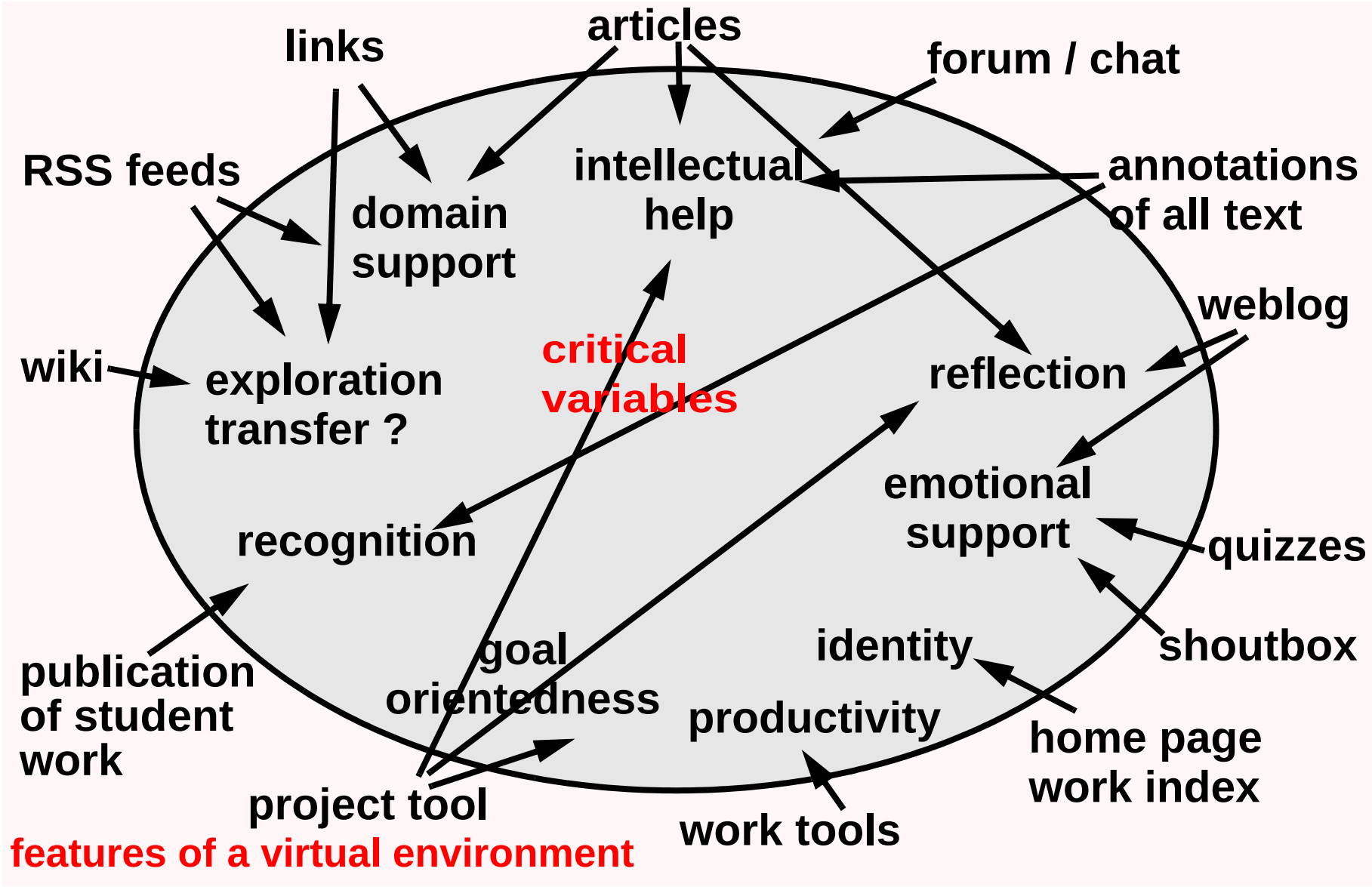
- **A LE must provide advantageous conditions at all**

6.2.Input from education science

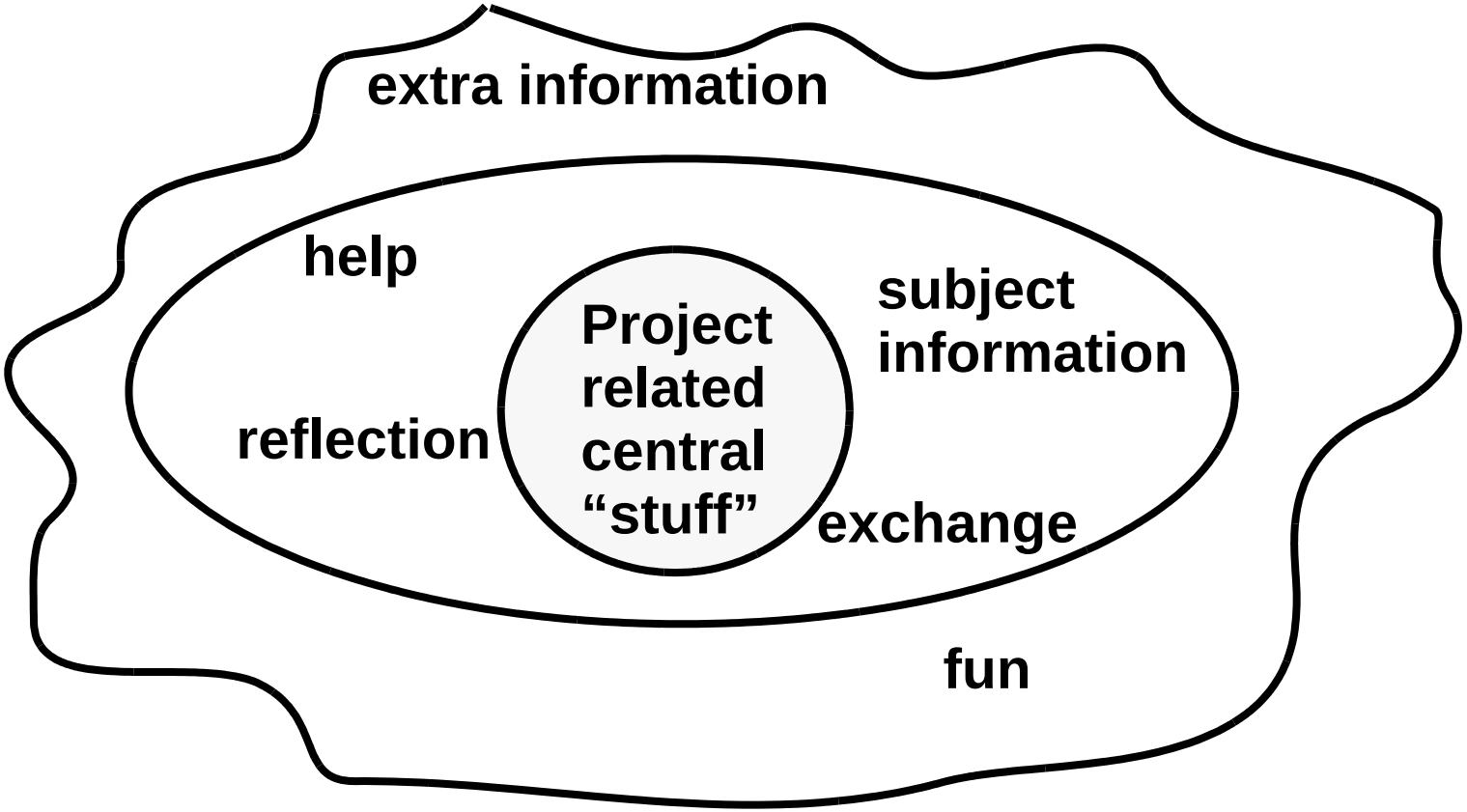


- **A learning environment must be complete !**

6.3.Input from research on virtual environments

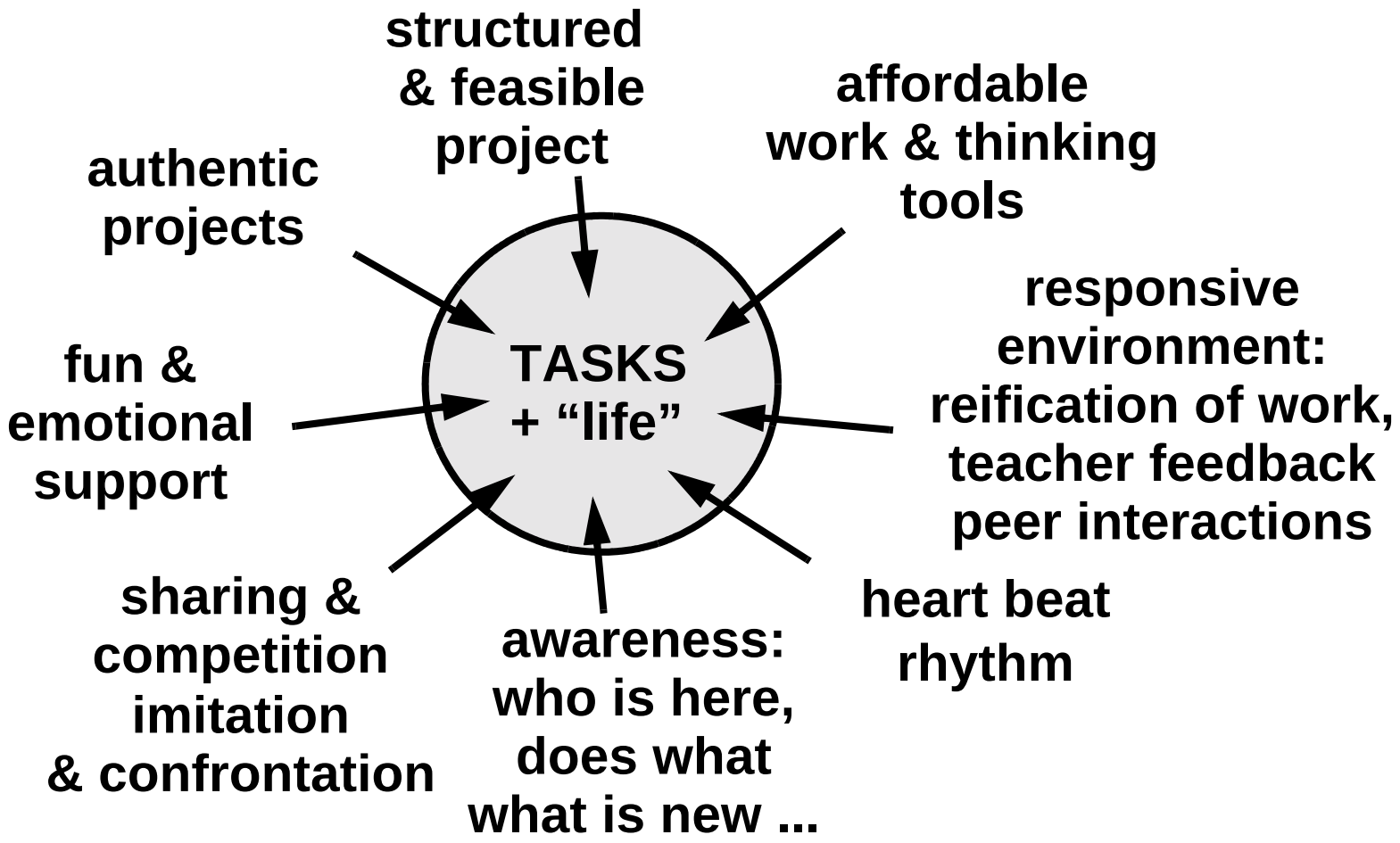


6.4.Input from activity based distance teaching



- **For each project there are central activities and tools**

6.5.Major features of a task-oriented learning environment

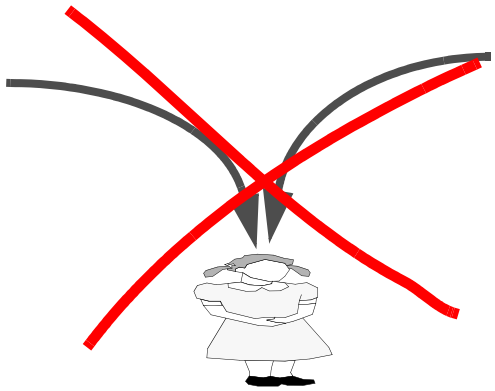


- **design of an LE must be project and task(s) centric**

6.6.Some conclusions

(1) Shift the focus from learning *materials* to learning *activities*

Support work *processes* !
Have students *produce things !*



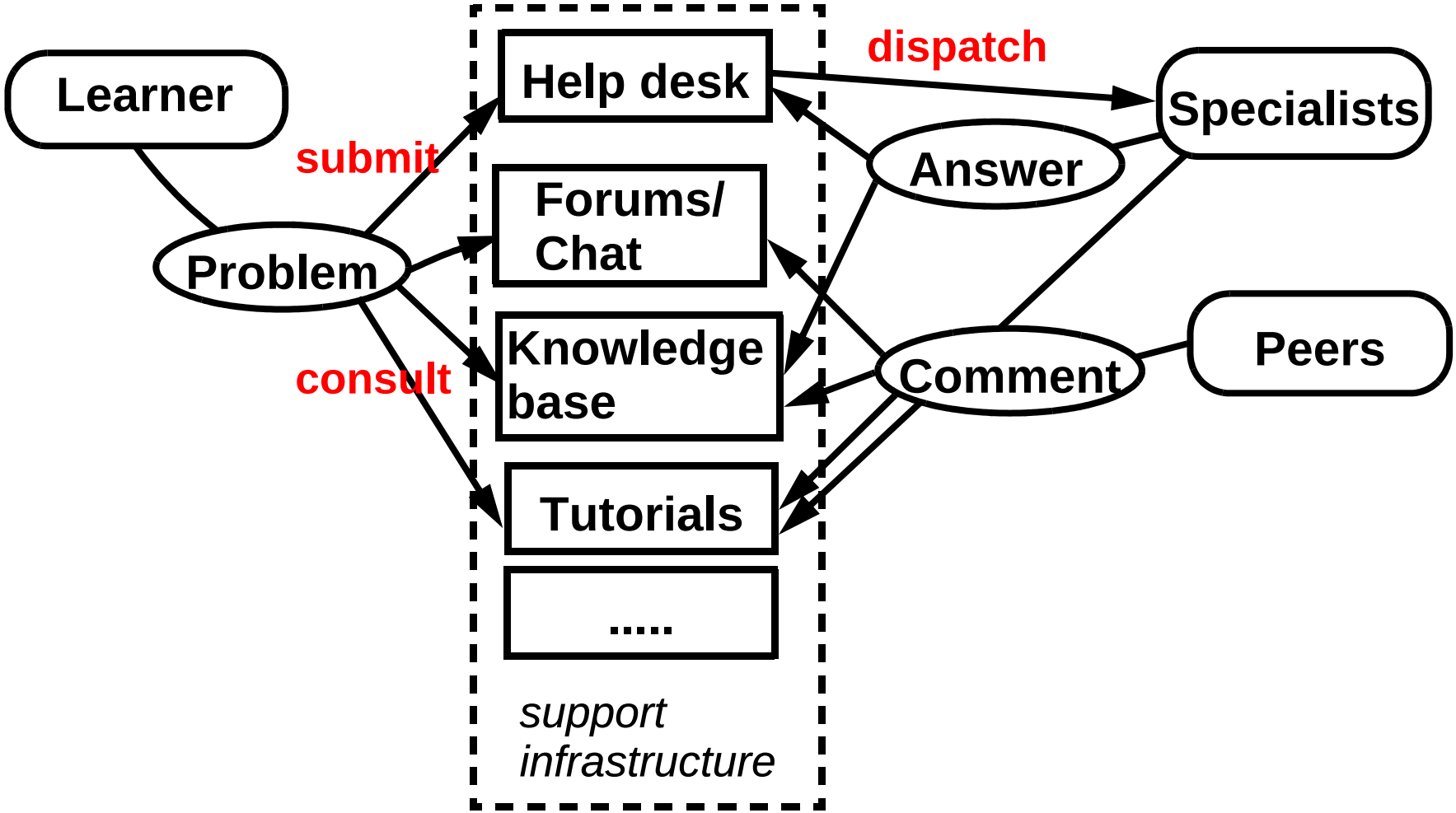
(2) Activity-based learner-centered pedagogics is teacher-centered design

(3) Need careful balance between structure & improvisation between monitoring and freedom

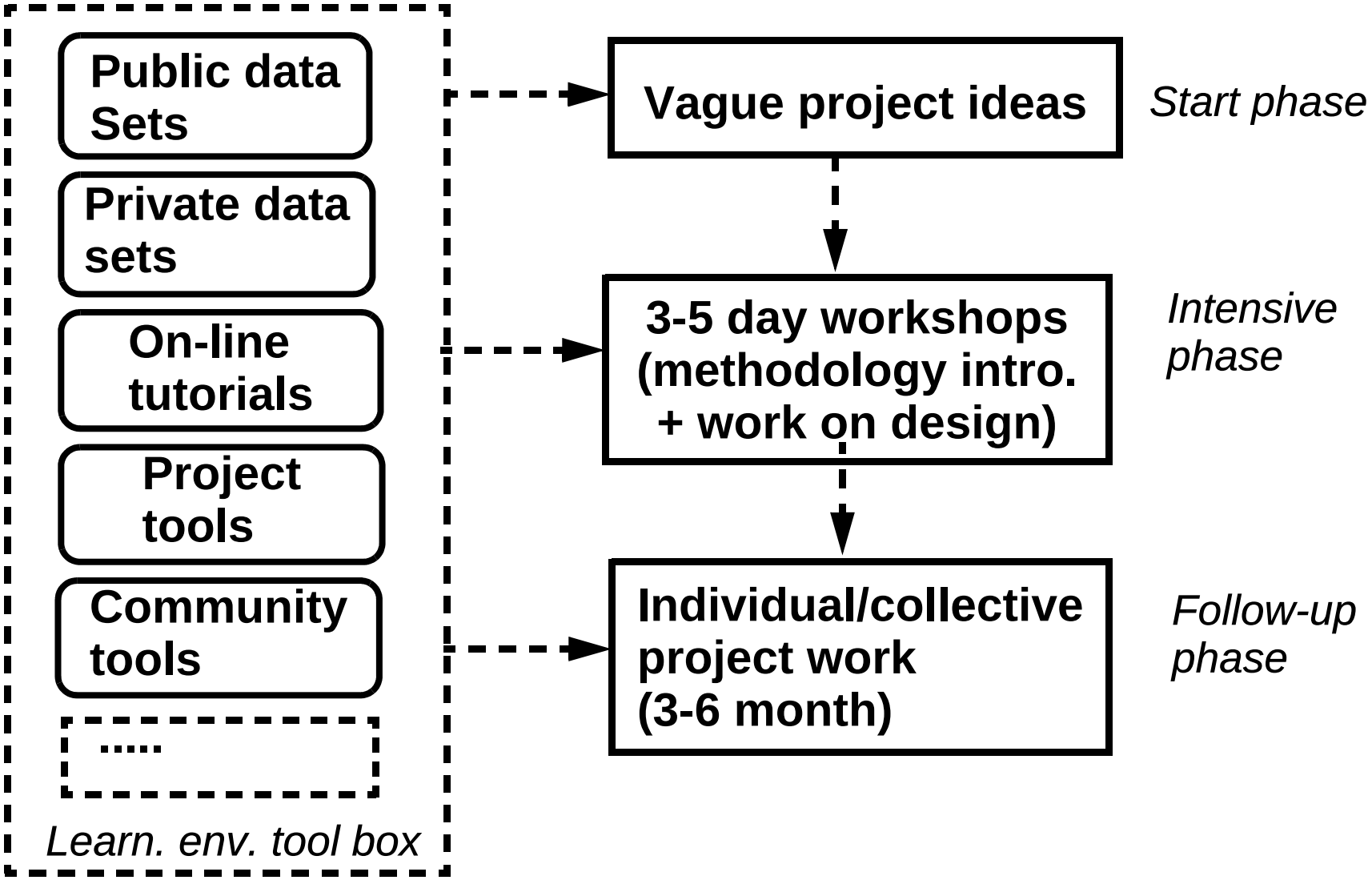
(4) Start with pedagogies & technologies that are somewhat *familiar*. E.g. use real workplace tools if possible.

7. Life-long methodology teaching: now what ?

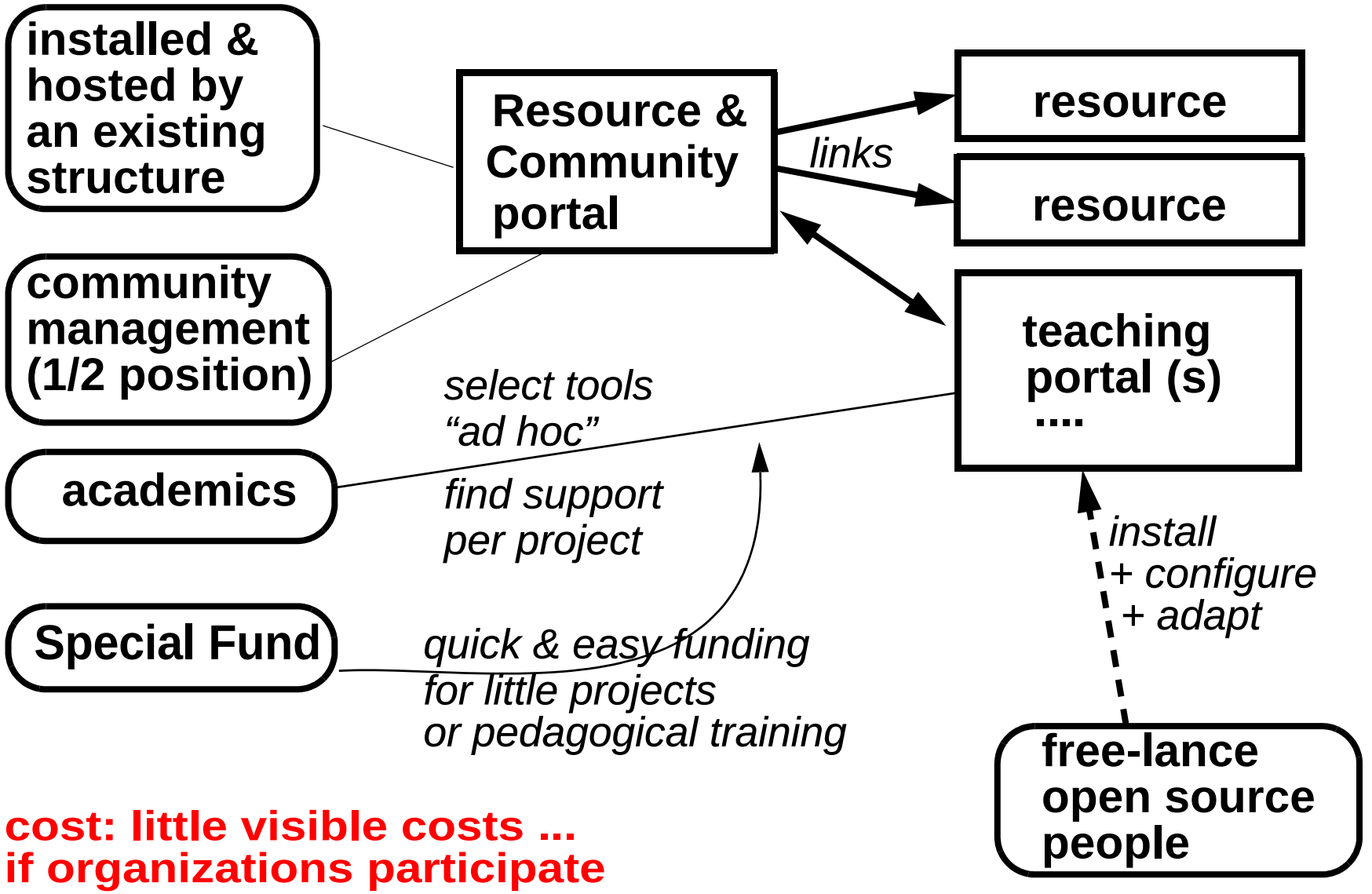
7.1 Situation 1: “On the spot” open learning



7.2.Situation 2: methodology “schools”

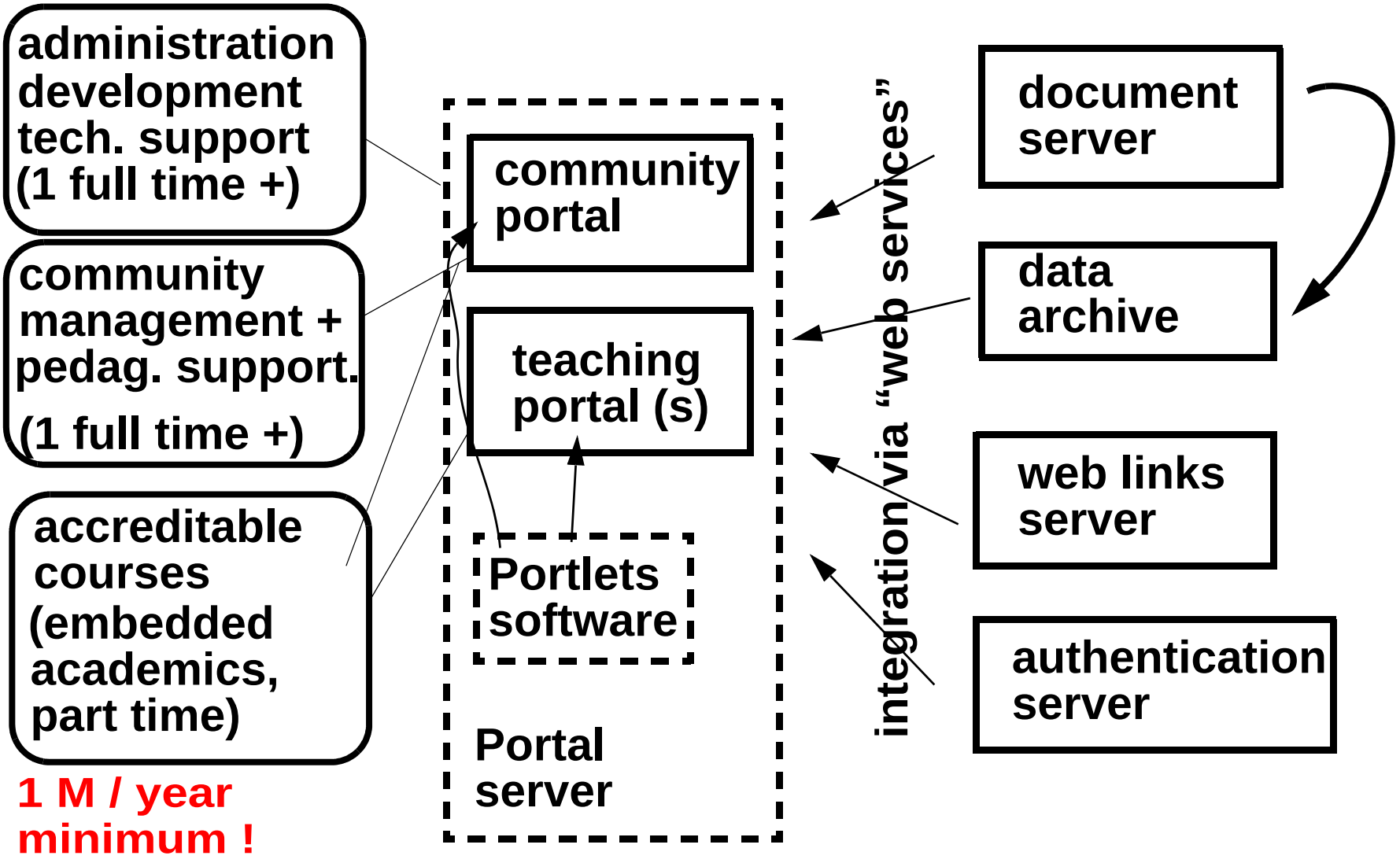


7.3.Infrastructure: the “grass roots” model



cost: little visible costs ...
if organizations participate

7.4.Infrastructure: the “big thing”



8. Endnote: See the SEED project

Tecfa SEED community site

- **http://tecfaseed.unige.ch/door/**

Available now:

- **exchange & some support**
- **examples of running portals (school & university education)**

Available soon (summer/fall 2003):

- **repackaged and documented "PostNuke" C3MS software**
- **modules for activity planning, project management, workshop organization, concept teaching, etc.**
- **Catalog = *cookbook* with "half-baked" *scenarios* and *tools***

SEED is an European IST programme project (No IST-2000-25214) and the swiss part is sponsored by the Swiss Federal Office for Education and Science (No OFES: 00.0287).