Conception and implementation of rich pedagogical scenarios through collaborative portals

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Code: mau-04
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1. Rich pedagogical scenarios in context

1.1 Instructional design: many dimension, many combinations

<table>
<thead>
<tr>
<th>Learning theories</th>
<th>behaviorism, constructionism, cognitivism, associativism, ....</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedagogical strategies</td>
<td>inspired by constructivism, Instructionalism, Socio-culturalism, ....</td>
</tr>
<tr>
<td>Pedagogical tactics</td>
<td>show, ask, exercises, projects, problems, simulations, ....</td>
</tr>
<tr>
<td>Technology</td>
<td>Learning mgmt systems, multimedia animations, workflow tools, community portals, micro-worlds, ....</td>
</tr>
<tr>
<td>Learning types</td>
<td>Attitudes, Facts, Concepts, Reasoning, Procedure Learning, Problem solving, Learning Strategies</td>
</tr>
<tr>
<td>Educ. format</td>
<td>face to face, blended, distance, .... small groups, large groups, ....</td>
</tr>
<tr>
<td></td>
<td>.... other elements</td>
</tr>
</tbody>
</table>

- I am just going to look at a subset of possible combinations !!!
1.2. Functions of a learning environment

- A learning environment has several functions
- Teacher role is central in "rich" activity-based designs (.....)

**Diagram Content:**

- "School" (curriculum & student administration)
- "Teacher" (guidance & instruction & design)
- "Monitor" (insures that something is learned)
- "Monitor" (fellow learners)
- "Monitor" (collaboration augments learning)
- "Monitor" (what has to be learned (courseware))
- "Monitor" (learning material)
- "Monitor" (information sources)
- "Monitor" (tools to produce things)
- "Monitor" (additional knowledge)
1.3. The problem with reproductive learning

Traditional lecturing
Students can’t apply

IMS/Scorm e-learning
Students can’t apply

How??

Menu of the talk
1.4. The problem with "let’s do projects" answer

Traditional learning by projects

- Students are lost
- How ??

- Vague ideas
- Can’t formulate goals
- Can’t relate data to concepts
- Research design
- Raw data
- Concepts
- Theory
- Can’t relate concepts
- Analysis
- Empirical work
- Can’t link concepts and data to theory

Knowledge
1. Rich pedagogical scenarios in context

1.5. A possible solution (goal of this talk)

Structured activity-based learning

Teacher role:
1. orchestration
2. monitoring
3. guidance

No specific learning materials!

- Tutorials on the web
- Scorm RLOs
- Forum messages
- Papers
- MIT OKI
- Powerpoint slides
- Books
2. The architecture of structured activity-based learning

2.1 Structured socio-constructivist pedagogical scenarios

- Open ended & “rich” socio-constructivist designs are more effective if individuals and groups have to evolve within somewhat specified scenarios.
• 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 “ur-loop” ... other variants!
2.2. A Note on the theoretical foundations

Socio-constructivist + a pinch of behaviorism

**behaviorism**  
*(reach knowledge objectives feedback, etc.)*

**constructivism**  
*(construct)*

**social cognition**  
*(interact with others)*

**situated & shared cognition**  
*(interact with the situation)*

Socio-constructivism(s)
3. Available tools: past, present and future (?)

3.1 We have got a curious situation

- listen
- look at multi-media
- surf on the Web

Content transmission w/o pedagogics:

- web pages / videos

Good content transmission: instructional pedagogies

"Learning Management Systems"

Socio-constructivist pedagogies:

Discuss, build, do?
3.2. A short time-line of Internet in education

1993

Teaching & learning with the Web
(thesis = learning by projects)
web pages & forums
Moos Wikis
...many good little things

2002

Open-ended scaffolded collaborative learning

2004

Activity portals?

Web-based training
WBT Systems
(anti-thesis = "instructional design")

"E-learning"
Learning management Systems

Menu of the talk
3.3 We need knowledge engines!

Transmissive pedagogies

- line by line...
- previous next
- repetition
- circular files

Activity-based pedagogics

- the computer as facilitating structure, as thinking, working & communication tool
- Support of student and teacher activities leading to new “contents”

- collaboration
- authentic tasks
- living documents

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3.4. Let’s use C3MS Portals!

Community, Content, & Collaboration Management Systems

- **Integration** of most applications (authentication, interfaces, ...)
- **Plug-in architecture**! (YOUR organization can write modules)
### 3.5. A good start: available C3MS bricks

<table>
<thead>
<tr>
<th>Function</th>
<th>C3MS modules (tools of the portal)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content management</strong></td>
<td>News engine (including a organization by topics and an annotation mechanism) - Content Management Systems (CMS) - Collaborative hypertexts (Wikis) - Image albums (photos, drawings, etc.) - Glossary tool or similar - Individual weblogs (diaries)</td>
</tr>
<tr>
<td><strong>Knowledge exchange</strong></td>
<td>News syndication (headlines from other portals) - File sharing (all CMS tools above)</td>
</tr>
<tr>
<td><strong>Exchange of arguments</strong></td>
<td>Forums and/or new engine - Chats, ......</td>
</tr>
<tr>
<td><strong>Project support</strong></td>
<td>Project management modules, - Calendars, ......</td>
</tr>
<tr>
<td><strong>Knowledge management</strong></td>
<td>FAQ manager - Links Manager (“Yahoo-like”) - Search by keywords for all contents - “top 10” box, rating systems for comments - “What’s new” (forum messages, downloads, etc.), ......</td>
</tr>
<tr>
<td><strong>Community management</strong></td>
<td>Presence, profile and identification of members - Shoutbox (mini-chat integrated into the portal page) - Reputation system - Activity tracing for members - Event calendar - News engine, ......</td>
</tr>
</tbody>
</table>
4. C3MS portals & educational scenario scripting

4.1 The global picture

- Projects
- Pedagogic Strategies
- Elementary activities (phases)
- C3MS bricks (software types)
- Activities (scenarios)
- Characteristics

- Stages
  - stage 1
  - stage 2
  - stage 3

+ Community & integration tools!!
4.2. Planning example: Study wildlife of Mauritius

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>GLOSSARY activity (scenario)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities (scenarios)</td>
<td>Stages</td>
</tr>
<tr>
<td>1</td>
<td>Participants think about terms</td>
</tr>
<tr>
<td>2</td>
<td>An alphabetic list of terms is entered</td>
</tr>
<tr>
<td>3</td>
<td>Students search and share links</td>
</tr>
<tr>
<td>4</td>
<td>Work is synthesized and combined</td>
</tr>
<tr>
<td>5</td>
<td>Teacher moderates</td>
</tr>
<tr>
<td>6</td>
<td>Final definitions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Simple activity</th>
<th>Description</th>
<th>Available C3MS modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>CoEdit</td>
<td>make collaborative documents</td>
<td>Wiki (phpWiki portal module), CMS (EzCMS module)</td>
</tr>
<tr>
<td>BrainStorm</td>
<td>Generate Ideas</td>
<td>Wiki, News Engine, Forums, Bulletin Boards</td>
</tr>
</tbody>
</table>
Implementation example of the Glossary activity

(previous step: learn portal)

<table>
<thead>
<tr>
<th>Stages</th>
<th>Tools</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Suggest terms: Wiki (= coll. hypertext)</td>
<td>Each student must suggest 3 terms and enter them</td>
</tr>
<tr>
<td>2</td>
<td>Provisional list of terms: Wiki</td>
<td>Together in class we clean up the list</td>
</tr>
<tr>
<td>3</td>
<td>Search and sharing of results: Google, Links manager</td>
<td>Each student must provide 4 links and make comments to 2 other</td>
</tr>
<tr>
<td>4</td>
<td>Raw information is synthesized and combined: Wiki</td>
<td>Each student must enter 2 definitions, make links from “his” definitions to others and modify others</td>
</tr>
<tr>
<td>5</td>
<td>Teacher moderates: News engine</td>
<td>Teacher will give feedback in an article</td>
</tr>
<tr>
<td>6</td>
<td>Students produce final definitions: Wiki</td>
<td>Students can make final modifications</td>
</tr>
</tbody>
</table>

( next step: find research subjects )
4.3. Scenario configuration with C3MS bricks
5. C3MS portals as learning environments

5.1 Two dimensions: sharp focus and fuzzy edges

• activities (scenarios) and a "place to be"! (virtual environment)
5.2. C3MS and support for creativity “elements”
5.3. LE design = landscaping & conditioning

- authentic projects
- fun & emotional support
- sharing & competition imitation & confrontation
- structured & feasible projects
- affordable work & thinking tools
- responsive environment: reification of work, teacher feedback peer interactions
- awareness: who is here, does what what is new ...
- heart beat rhythm
- tasks + “life”
- imitation & confrontation
- reification of work,
- teacher feedback
- peer interactions
- awareness: who is here, does what what is new ...
- heart beat rhythm
- tasks + “life”
- imitation & confrontation
- reification of work,
- teacher feedback
- peer interactions
- awareness: who is here, does what what is new ...
- heart beat rhythm
- tasks + “life”
6. First conclusions: Hey we are teacher-centric!

Teacher as orchestrator
- designs the environment
- designs the global project
- designs flexible tasks

Teacher as monitor
- makes audits
- reads blogs
- controls project plans
- evaluates

Teacher as facilitator
- gives feedback
- answers questions
- writes tutorials
- makes examples
- provides links

..... (now try to do this without ICT!)
7. A provisional account of our work

7.1 Portals everywhere!

Teacher Portals (4) e.g. Petit Bazar

School portals (3)

University courses (2) Distance teaching

Teaching portals (5) (All education levels)

Seed portal

Internet activites Terre des hommes & Pangea

Internet activity Antarctica

Teachers

Students

Pupils

Researchers

Support

Domain

Parents

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### 7.2. Problems and issues at school level (age 10 to 19)

<table>
<thead>
<tr>
<th>Object</th>
<th>Problems</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>the portal concept</strong></td>
<td>• teachers &amp; pupils are not <strong>familiar</strong></td>
<td>• train, introduce slowly (over 3 years min.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• force (@Tecfa)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• install portals everywhere</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• host portals at Tecfa</td>
</tr>
<tr>
<td><strong>scenarios</strong></td>
<td>• teachers are <strong>not used to create scenarios with ICTs</strong></td>
<td>• provide support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• sponsor simple activities <em>and</em> more complex as option</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• provide catalogue, examples</td>
</tr>
<tr>
<td><strong>scenarios</strong> in schools:</td>
<td>• <strong>no time</strong> • curriculum</td>
<td>• exploit opportunities in the curriculum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• transversal activities</td>
</tr>
<tr>
<td>Object</td>
<td>Problems</td>
<td>Possible solutions</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Internet</strong></td>
<td>• fear to “show”,</td>
<td>• sponsor virtual teacher communities with the same</td>
</tr>
<tr>
<td></td>
<td>• lack of &quot;Internet spirit&quot;</td>
<td>tool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• give examples</td>
</tr>
<tr>
<td><strong>the system</strong></td>
<td>• censorship,</td>
<td>• contournement (provide hosting or private providers)</td>
</tr>
<tr>
<td></td>
<td>• firewalls,</td>
<td>• lobbying, etc.</td>
</tr>
<tr>
<td></td>
<td>• server politics,</td>
<td>• training of all stakeholders (with integrated projects)</td>
</tr>
<tr>
<td></td>
<td>• slowness,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• incompetency &amp; nastiness ...</td>
<td></td>
</tr>
<tr>
<td><strong>technology</strong></td>
<td>• no standards</td>
<td>• “street standards” or Java/portlets or “webservices”?</td>
</tr>
<tr>
<td></td>
<td>• too much “text”</td>
<td>• IMS/ “learning design” ?</td>
</tr>
<tr>
<td></td>
<td>• no workflow</td>
<td>• add graphics (later)</td>
</tr>
</tbody>
</table>
8. Case study I: Inter-class Internet activities

8.1 Recall of the situation (in central Europe)

Teachers are not trained to do projects

Teachers are not trained to use ICT as work tool

Refusal rate is very high

Failure rate is high

it’s difficult

Organize collective "Internet activities" and encourage teachers to participate

Cross-curricular project-based learning with ICT can only be introduced gradually

Sponsor teacher portals
8.2. So what are so called "Collective Internet activities"?

- "Organized" by some consortium (usually with different stakeholders)
- Often an interdisciplinary topic
- Often a set of various activities & various levels of participation
- Teachers can participate with their class (on their own decision or with the support of a school)

Informal! no general rules!
8.3. Example 1: "Terre des hommes": water

url: http://tecfaseed.unige.ch/tdh03/

- Stakeholders: NGO, a few teachers, TECFA (my group)
- Goal: Work on issues related to "water"

Main activities:

1. Queries (enquêtes) or react to news (réagir à l’actualité)
2. Photo and picture albums (+ comment)
3. Make a quiz or do a quiz
4. Add links (+ comment)
5. Enter a glossary item, a quotation or a poem
6. Free discussion

Teacher-teacher activities:

- Forums
- Scenario definitions (teachers describe good scenarios)
8.4. Example 2: "Educapoles"

url: http://tecfaseed.unige.ch/educapoles/

• Stakeholders: NGO, a few teachers, TECFA (my group)
• Goal: Follow and interact with a research expedition to the south pole

Main activities:
1. suggest experiments to relays on the ship (a few pupils)
2. request data
3. ask questions

Teacher-teacher activities:
• Forums

Organizer-teacher activities:
• news
• suggestions
8. Case study I: Inter-class Internet activities

8.5. Internet activities as teacher development

Inspiration

Teachers who can "do" effective projects
Pupils learn project work and some subject matters

5 - 60 years

Teachers who will get return on investment
Pupils learn something (either ICT or subject matters, including curricular ones)

2-3 years

"First time "Teachers (may not be effective, will do better next time)
Pupils a learn a little ICT, e.g. buttons of the forums
8.6 What kind of Infrastructure do we need?

- Walls of the classroom (collective class working memory)
- 1-4 computers in the classroom
- Little learning contents
- A flexible information & communication portal
- A project community
- Something to study
9. Case study 2: Project-based teaching at master level

- Life example: http://tecfaseed.unige.ch/staf18/

Blended (mixed) 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

Project-based
- large freedom for choice of subjects within the general theme
- scheduling of tasks (exploration, project plan, audits,... )
- some mandatory collective work
- each major activity is graded

Each year a different topic
- Topic 2002/3: “Exotic hypertexts”
- Topic 2004/4: "Visualization and semantic web"
(... this format is also used by a few other courses)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
<th>imposed tools (products)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarization with subject(s)</td>
<td>21-NOV-2002</td>
<td>links, wiki, blog</td>
</tr>
<tr>
<td>project ideas, Q&amp;R</td>
<td>29-NOV-2002</td>
<td>classroom</td>
</tr>
<tr>
<td>Students formulate project ideas</td>
<td>02-DEC-2002</td>
<td>news engine, blog</td>
</tr>
<tr>
<td>Start project definition</td>
<td>05-DEC-2002</td>
<td>ePBL, blog</td>
</tr>
<tr>
<td>Finish provisional research plan</td>
<td>06-DEC-2002</td>
<td>ePBL, blog</td>
</tr>
<tr>
<td>Finish research plan</td>
<td>11-DEC-2002</td>
<td>ePBL, blog</td>
</tr>
<tr>
<td>Sharing activity</td>
<td>17-DEC-2002</td>
<td>links, blog, annotation</td>
</tr>
<tr>
<td>audit</td>
<td>20-DEC-2002</td>
<td>ePBL, blog</td>
</tr>
<tr>
<td>audit</td>
<td>10-JAN-2003</td>
<td>ePBL, blog</td>
</tr>
<tr>
<td>Finish paper and product</td>
<td>16-JAN-2003</td>
<td>ePBL, blog</td>
</tr>
<tr>
<td>Presentation of work</td>
<td>16-JAN-2003</td>
<td>classroom</td>
</tr>
</tbody>
</table>
In ADDITION, every activity can make use of:

- shoutbox (a mini chat)
- links (a collection of useful resources)
- RSS feeds (news feeds from other portals)
- wiki (collaborative hypertext)
- various forums (for student-triggered support)
- articles + annotations
- calendar
- various awareness tools (presence, what’s new)!
- other special purpose tools
9.2. The ePBL tool: 3 core functions

(Ph.D. thesis of Paraskevi Synteta on project-based learning)

(1) Project Tool

- File sharing system + formal XML grammar for: main research question, objectives and associated research questions, approach & methods, work packages management
- It is a working/thinking/monitoring tool

(2) Audit/Grading Tool: Tied to work packages & student projects

(3) Paper / virtual book
10. Final remarks

1. Do not "over-script" (let students “build”)

2. Activities => tools => productions
   (“communication as substance”)

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