Instructional and Technical Frameworks for Online Distance Learning

University of Mauritius
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Code: mau05
Menu of the talk

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I Why you should worry

- Technologies
- Learning theories
- Teaching theories
- Design theories
1. The problem space

1.1 Learning & teaching: many dimensions & combinations !!

<table>
<thead>
<tr>
<th>Learning theories</th>
<th>behaviorism, constructionism, cognitivism, associationsim, ....</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>.... other elements</td>
<td></td>
</tr>
</tbody>
</table>

A very complex affair, the next few slides just address a few issues .... !
1.2. Learning theories?

Some major schools of thought that will lead to different designs:

- **Behaviorism**: (reach knowledge objectives, feedback, etc.)
- **Constructivism**: (construct)
- **Social cognition**: (interact with others)
- **Situated & shared cognition**: (interact with the situation)
- **Socio-constructivism(s)**
A few issues on which we could focus

- authentic tasks
- community
- information
- freedom (open) construction
- control scaffolding
- activities
- exercises
- individual

not that much operational .....
1.3. Major pedagogical approaches (strategies)

(Baumgartner & Kalz), there are many other typologies ...

<table>
<thead>
<tr>
<th>Transfer</th>
<th>Tutor</th>
<th>Coach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factual knowledge,</td>
<td>Procedural knowledge,</td>
<td>Social practise,</td>
</tr>
<tr>
<td>“know-that”</td>
<td>“know-how”</td>
<td>“knowing in action”</td>
</tr>
<tr>
<td>Transfer of propositional</td>
<td>Presentation of predetermined</td>
<td>Action in (complex and social)</td>
</tr>
<tr>
<td>knowledge</td>
<td>problems</td>
<td>situations</td>
</tr>
<tr>
<td>to know, to remember</td>
<td>to do, to practise</td>
<td>to cope, to master</td>
</tr>
<tr>
<td>Production of correct</td>
<td>Selection of correct methods</td>
<td>Realization of adequate</td>
</tr>
<tr>
<td>answers</td>
<td>and its use</td>
<td>action strategies</td>
</tr>
<tr>
<td>Verbal knowledge, Memoria</td>
<td>Skill, Ability</td>
<td>Social Responsibility</td>
</tr>
<tr>
<td>to teach, to explain</td>
<td>to observe, to help, to</td>
<td>to cooperate, to support</td>
</tr>
<tr>
<td></td>
<td>demonstrate</td>
<td></td>
</tr>
</tbody>
</table>

Things (learning types, learning level, teaching, etc.) come clustered!
1.4. Types of Learning (Kearsley’s [http://tip.psychology.org/](http://tip.psychology.org/))

1. **Attitudes:**
   - Disposition or tendency to respond positively or negatively ....

2. **Factual Information (Memorization):**
   - Processing of factual information and remembering .....

3. **Concepts (Discrimination):**
   - ... how to discriminate and categorize things. It is not related to simple recall and must be constructed.

4. **Reasoning (Inference, Deduction):**
   - thinking activities that involve making or testing inferences

5. **Procedure Learning:**
   - .... being able to solve a certain task by applying a procedure.

6. **Problem solving:**
   - identification of subgoals, use of methods to satisfy subgoals.

7. **Learning Strategies:**
   - can hardly be taught and only be learned and to some extent only!
1.5. Pedagogical strategies and methods?

E.g. Khan’s (2000) list of Methods and Strategies

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Exhibits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstration</td>
<td>Drill and Practice</td>
</tr>
<tr>
<td>Tutorials</td>
<td>Games</td>
</tr>
<tr>
<td>Story Telling</td>
<td>Simulations</td>
</tr>
<tr>
<td>Role-playing</td>
<td>Discussion</td>
</tr>
<tr>
<td>Interaction</td>
<td>Modeling</td>
</tr>
<tr>
<td>Facilitation</td>
<td>Collaboration</td>
</tr>
<tr>
<td>Debate</td>
<td>Field Trips</td>
</tr>
<tr>
<td>Apprenticeship</td>
<td>Case Studies</td>
</tr>
<tr>
<td>Generative Development</td>
<td>Motivation</td>
</tr>
</tbody>
</table>

So we have more to worry:
What strategies work better for what types of learning?
1.6. Functions of a learning environment: Where do we focus?

- E.g. **teacher role** is central in activity-based designs
- E.g. **Learning material** is important for mass-education

(modified from Sandberg)
A simplified version ....

Information space
Knowledge

Learner

Teacher
Tutor
Designer
Content Expert

Learning space
Learning Activities

How should we define roles, structures and relations?
1.7. Motivation: learn from computer games or flow theory?
   • Motivation is key element (particularly in distance teaching)

Intrinsically motivating elements of gaming: a curious blend ...
(Frete 2002, Master thesis)

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
</table>
| fantasy            | • imagination and freedom  
                     (make believe + voluntary activity)                                      |
| challenge & curiosity | • a level of difficulty that triggers curiosity  
                           • presence of goals  
                           • uncertainty (surprise)                                             |
| feedback           | • immediate  
                     • clear                                                                |
| self-esteem        | • adapted tasks  
                     • encouragement to learn & augment scores                               |
| control            | • levels to play, user selection of goals, strategies & tactics             |
Csikszentmihalyi’s elements of “optimal experience” (flow) applied to programming and gaming activities:

<table>
<thead>
<tr>
<th>element</th>
<th>games</th>
<th>programming</th>
<th>learning</th>
<th>designs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>good</td>
<td>bad</td>
<td></td>
</tr>
<tr>
<td>1. optimal challenge</td>
<td>xx</td>
<td>x</td>
<td>no</td>
<td>improvable</td>
</tr>
<tr>
<td>2. immersion</td>
<td>xx</td>
<td>x</td>
<td>no</td>
<td>improvable</td>
</tr>
<tr>
<td>3. clear goals</td>
<td>xx</td>
<td>x</td>
<td>no</td>
<td>improvable</td>
</tr>
<tr>
<td>4. immediate feedback</td>
<td>xx</td>
<td>x</td>
<td>x</td>
<td>improvable</td>
</tr>
<tr>
<td>5. concentration</td>
<td>xx</td>
<td>x</td>
<td>no</td>
<td>?</td>
</tr>
<tr>
<td>6. sense of control</td>
<td>xx</td>
<td>?</td>
<td>no</td>
<td>improvable</td>
</tr>
<tr>
<td>7. disappearing self</td>
<td>xx</td>
<td>x</td>
<td>no</td>
<td>?</td>
</tr>
<tr>
<td>8. altered sense of time</td>
<td>xx</td>
<td>x</td>
<td>no</td>
<td>?</td>
</tr>
</tbody>
</table>

... take advice from “skilled programming” and gaming?
2. Instructional design

2.1 The instructionalist voice?

A. The executive summary:

- **Reading** is NOT learning
  - One must “do” to learn
- Most learning material (e.g. Internet) is NOT interactive (per se)
  - Skills and concepts can only be learned through **activity**
    (triggered by the system and/or by the task)
- Passing an exam or a MCQ does NOT guarantee much
  - One must do “real” tasks to insure transfer
- Most people need **guidance** to achieve instructional goals
  - External conditioning (teaching, monitoring)

Now that is quite understandable, however, let’s look at some more detailed principles ....
B. Example: Merril’s criteria for 5 Star Instructional Design’s

Not applicable to transmissive (“spray-and-pray” / or exploratory designs (“sink-or swim”).

1. Does the courseware relate to real world problems?
   a.... show learners the task or the problem they will be able to do/solve ?
   b.are students engaged at problem or task level not just operation or action levels?
   c.... involve a progression of problems rather than a single problem?

2. Does the courseware activate prior knowledge or experience?
   a.do learners have to recall, relate, describe, or apply knowledge from past experience
      (as a foundation for new knowledge) ?
   b.does the same apply to the present courseware ?
   c.is there an opportunity to demonstrate previously acquired knowledge or skill ?

3. Does the courseware demonstrate what is to be learned ?
   a.Are examples consistent with the content being taught? E.g. examples and non-
      examples for concepts, demonstrations for procedures, visualizations for
      processes, modeling for behavior?
   b. Are learner guidance techniques employed? (1) Learners are directed to relevant
      information?, (2) Multiple representations are used for the demonstrations?, (3)
      Multiple demonstrations are explicitly compared?
   c.Is media relevant to the content and used to enhance learning?
4. Can learners practice and apply acquired knowledge or skill?
   
a. Are the application (practice) and the post test consistent with the stated or implied objectives? (1) Information-about practice requires learners to recall or recognize information. (2) Parts-of practice requires the learners to locate, name, and/or describe each part. (3) Kinds-of practice requires learners to identify new examples of each kind. (4) How-to practice requires learners to do the procedure. (5) What-happens practice requires learners to predict a consequence of a process given conditions, or to find faulted conditions given an unexpected consequence.

b. Does the courseware require learners to use new knowledge or skill to solve a varied sequence of problems and do learners receive corrective feedback on their performance?

c. In most application or practice activities, are learners able to access context sensitive help or guidance when having difficulty with the instructional materials? Is this coaching gradually diminished as the instruction progresses?

5. Are learners encouraged to integrate (transfer) the new knowledge or skill into their everyday life?

a. Is there an opportunity to publicly demonstrate their new knowledge or skill?

b. Is there an opportunity to reflect-on, discuss, and defend new knowledge or skill?

b. Is there an opportunity to create, invent, or explore new and personal ways to use new knowledge or skill?

=> This is rather a list of evaluation criteria
2.2. The socio-constructivist voice?

Socio-constructivist features of on-line teaching (Taylor and Maor)

1. Relevance: How relevant is on-line learning to students' professional practices?

2. Reflection: Does on-line learning stimulate students' critical reflective thinking?

3. Interactivity: To what extent do students engage on-line in rich educative dialogue?

4. Tutor Support: How well do tutors enable students to participate in on-line learning?

5. Peer Support: Is sensitive and encouraging support provided on-line by fellow students?

6. Interpretation: Do students and tutors make good sense of each other's on-line communications?
2.3. So how shall we proceed?

E.g. MISA/MOT/ADISA: Course designer works on "4 models"

1. **Knowledge and Skill Representation**
   DC: Design of Content (know-that and know-how)

2. **Application of Teaching Methods and Approaches**
   DP: Design of Pedagogical specifications

3. **Specification of Learning Materials**
   DM: Design of Materials

4. **Delivery Planning**
   DD: Design of Delivery

Using such a method (see next slide) is worth the effort:

- if you plan do it right (e.g. buy the MOT editor)
- if you focus on a whole course instead of difficult problems
- if you plan to train yourself in instructional design

url: http://www.cogigraph.com
Too much for you? Let's rather look at "natural types"
II Natural types

The Internet Model: how it (re)started

Structured activity-based project-oriented learning

Microworlds, simulations, rich exercising machines

CSCL (Computer supported collaborative learning)

Weblogs

Content & Document Management Systems

The Wiki way

The "help desk model" for life-long learning

Teleteaching

Main stream "e-learning"

Learning within a community

Groupware and CSCW
3. What’s out there? What do people really use?

3.1 Rationale and plan for the rest of the talk ...

A few remarks:

- There is a HUGE amount of designs and technology
- What is currently marketed (e-learning/Learning Management systems) does not necessarily represent what people really use
- Distance teaching universities are just moving in. They know what DT means and don’t want to compromise
- Most sustainable designs are developed within “blended formats” by “ordinary” but creative university teachers
- Research produces interesting but costly designs

Plan

- Show a relevant subset of existing designs (biased of course !)
- Focus on (1) “Internet Model” (2) simple e-learning (3) Project-based learning with portals.
- **Missing**: ROI (there only 2 reasons why you should engage in e-learning, and a lot against)
3. What's out there? What do people really use?

3.2. A condensed historical view

1993

Teaching & learning with the Web
(thesis = learning by projects)

web pages & forums

Moos
Wikis
Groupware
Weblogs
....... 

1993

CBL (1961-)

Web-based training

WBT Systems

(anti-thesis = "instructional design")

2002

Scaffolded collaborative learning

Activity portals?

2005

"E-learning"

Learning management Systems

Moos
Wikis
Groupware
Weblogs
....... 

...many good little things

Natural types © TECFA 8/4/05
4. The Internet Model: how it (re)started

Internet: services et "spirit" 1980-1993

- Messages
  - Mail
  - News

- FTP

- Telnet

Distribution and file exchange

Interactive work at distance

Exchange - communication - collaboration
Everyone can participate
### 4.1. Structural similarities ...

<table>
<thead>
<tr>
<th>&quot;internet spirit&quot;</th>
<th>&quot;US grad-school teaching&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>communication</td>
<td>students give talks</td>
</tr>
<tr>
<td>participation</td>
<td>class discussions</td>
</tr>
<tr>
<td>exchange</td>
<td></td>
</tr>
<tr>
<td>no central</td>
<td>professor’s opinion</td>
</tr>
<tr>
<td>organization</td>
<td>can be challenged</td>
</tr>
<tr>
<td>users are active</td>
<td>students do projects</td>
</tr>
<tr>
<td>participate</td>
<td></td>
</tr>
<tr>
<td>Internet is rich</td>
<td>libraries are rich</td>
</tr>
<tr>
<td>and open</td>
<td>and open ;)</td>
</tr>
</tbody>
</table>
4. The Internet Model: how it (re)started

4.2. The traditional technical infrastructure & its use

1. WWW (hypertext), e.g. for:
   a. planning, curricula, agendas, assignments
   b. texts, manuals, resources and pointers
   c. assignments (student productions)
   d. collaboration within group projects

2. Email, e.g. for:
   a. agenda planning (teacher)
   b. search for information (student)
   c. information about updates (student, teacher)
   d. short comments (teacher)

3. Discussion Forums, e.g. for:
   a. debates (about articles or themes)
   b. technical Q/A
   c. student-student help (!)

4. Some chat or similar (text or audio/video)
   a. urgent things
   b. co-presence (common virtual space, radio channels)
   c. virtual meetings for simple discussions

The simple "Internet soup"
4. The Internet Model: how it (re)started

4.3. Moodle-like systems are based on this tradition

http://moodle.org/

- activity-based design
- CMS tools
- socio-constructivist flavor
- supports many designs
5. Main stream "e-learning"

5.1 Purpose and features

- Based on CBT ("Computer-based training"), 1961,
- Mostly "tell & ask" (learning I), inclusion of learning II possible
- Dozens of commercial and open source systems

Common main features of Learning Management Systems:
- Closed circuit platforms (logins, restricted access to classes)
- Asynchronous Communication: email, forums
- Synchronous Communication: chat, whiteboard, teleconferencing,
- Student tools: home page, self tests, bookmarks, progress tracking, ....
- Student Mgmt Tools: progress tracking, on-line grading, ....
- Lessons tools: authoring (structured XML or HTML), testing (e.g. Java Script generators)
5.2. Screenshot from ATutor

Interactive JS or Java code can also be included
5.3. Overall course design: the module principle

The module architecture

- Pretest
- Next module
- Entry test
- Module
- Other module
- Previous Module
- Recall activity

Objectives (Matter to be learned)
5.4. Architecture of a module (lesson, topic)

- Should follow (some) sound instructional design principles, e.g. Gagné’s 9 steps of instruction for learning I + II
  
  a. **Gain attention** e.g. present a good problem, a new situation, use a multimedia advertisement.
  
  b. **Describe the goal**: e.g. state what students will be able to accomplish and how they will be able to use the knowledge, give a demonstration if appropriate.
  
  c. **Stimulate recall of prior knowledge** e.g. remind the student of prior knowledge relevant to the current lesson (facts, rules, procedures or skills). Show how knowledge is connected, provide the student with a framework that helps learning and remembering. Tests can be included.
  
  d. **Present the material** to be learned e.g. text, graphics, simulations, figures, pictures, sound, etc. Chunk information (avoid memory overload, recall information).
  
  e. Provide **guidance for learning** e.g. presentation of content is different from instructions on how to learn. Use of different channel (e.g. side-boxes)
  
  f. Elicit **performance "practice"**, let the learner do something with the newly acquired behavior, practice skills or apply knowledge. At least use MCQ’s.
  
  g. 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
  
  h. **Assess** performance test, if the lesson has been learned. Also give sometimes general progress information
  
  i. Enhance retention and **transfer**: inform the learner about similar problem situations, provide additional practice. Put the learner in a transfer situation. Maybe let the learner review the lesson.
5.5. Standards

Implemented standards mostly focus on (modular) content:

- Describe CBT contents as data
- sequential content, quizzing, packaging, meta-data, etc.
  (Unclear instructional standards: page-turning “shovelware” only ?)

- Modularity
  - Allows for modular management of reusable learning contents
  (But: how easily can contents be hacked à part and repurposed ?)

- New: Learning Design (LD) educational markup language
  - engines are under way (e.g. a MOT extension)
  - difficult !
  (yet unclear how it could support socio-constructivist pedagogies)

- Summary:
  - Good standards for so far (!) simple instructionalist pedagogies
  - Compliant Learning Content & Management Systems exist

Major standard bodies

- IMS and Scorm (mostly an IMS-based operational subset)
6. Structured activity-based project-oriented learning

6.1 Motivation: the problem with reproductive tell & ask learning

Traditional lecturing

how ??

IMS/Scorm e-learning

how ??

students can’t apply

students can’t apply
6. Structured activity-based project-oriented learning

6.2. The problem with "let’s do projects" answer

Traditional learning by projects

- students are lost
- how ??
- students have trouble with research designs
- can’t relate concepts and data to theory
- can’t link concepts and data to theory
- can’t relate concepts
- can’t relate data to concepts
- concepts
- raw data
- research design
- empirical work
- analysis
- theory
- knowledge

vague ideas

- chaos
- students can’t formulate goals
- students can’t formulate goals

Natural types © TECFA 8/4/05
6.3. A possible solution

Structured activity-based learning

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

No specific learning materials!

url: http://tecfaseed.unige.ch/door/
url: http://tecfa.unige.ch/proj/seed/catalog/
6.4 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!
6.5. LMS (learning I) vs. knowledge engines (learning III)!

Transmissive pedagogies
- line by line...
- 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
6.6. C3MS Portals for Learning III support!

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

- **Story engine** (“stories, logs”) + annotations
- **calendar**
- **forums**
- **Web links mgmt.**
- **Download mgmt.**
- **... many other tools**

- **authentication**
- **Administration**

- **Integration** of most applications (authentication, interfaces, ...)
- **Plug-in architecture**! (YOUR organization can write modules)
## 6.7. 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>
6. Structured activity-based project-oriented learning

6.8 C3MS portals & educational scenario scripting

Projects

Activities (scenarios)
- characteristics
- Stages
  - stage 1
  - stage 2
  - stage 3

Pedagogic Strategies

Elementary activities (phases)

C3MS bricks (software types)

+ community & integration tools !!

software modules
6.9. 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</td>
</tr>
<tr>
<td></td>
<td>about terms</td>
</tr>
<tr>
<td>2</td>
<td>An alphabetic list</td>
</tr>
<tr>
<td></td>
<td>of terms is entered</td>
</tr>
<tr>
<td>3</td>
<td>Students search and share</td>
</tr>
<tr>
<td></td>
<td>links</td>
</tr>
<tr>
<td>4</td>
<td>Work is synthesized and</td>
</tr>
<tr>
<td></td>
<td>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</td>
<td>Wiki (phpWiki portal module), CMS (EzCMS module)</td>
</tr>
<tr>
<td></td>
<td>documents</td>
<td></td>
</tr>
<tr>
<td>BrainStorm</td>
<td>Generate Ideas</td>
<td>Wiki, News Engine, Forums, Bulletin Boards</td>
</tr>
</tbody>
</table>

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

( next step: find research subjects )
6.10. Scenario configuration with C3MS bricks

TecfaSEED catalog

- Define scenarios
- Innovations from the "field"

Teacher's portal

- Community, fun & integration tools
- Selection & configuration

TECFA modules

- Standard modules
- Extra modules
- Portalware

Program

Download/ plug (and/or adapt)

Installation + configuration
6.11. Teacher roles in a C3MS approach

- **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!)

- **More to come**: C3MS also must be designed as virtual environments and support the learning community
7. Learning within a community

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
7.1 On-line virtual environments for communities

- A "place to be"! (virtual environment implies social presence)
- Activity support
- .... many sorts of virtual environments
7.2. C3MS and support for creativity “elements”

- links
- articles
- forum
- annotations
- RSS feeds
- domain support
- intellectual help
- blog
- exploration
- support
- transfer
- creativity
- & engagement
- supporting
- variables
- recognition
- reflection
- emotional support
- identity
- goal orientedness
- home page
- work index
- project tool
- C3MS bricks
- book
- quiz
- shoutbox

Natural types © TECFA 8/4/05
7.3. 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

Activities + “life”
7.4. Other alternatives to C3MS as virtual environments

- **Multi-user Dungeons (MUDs) and MMORPGs**
  - "community building"
  - apprenticeship

- **Immersive virtual realities**
  - direct experimentation
  - constructions
  - procedure learning

- **Augmented virtual realities**
  - collaborative work

- **Combined multi-user environments**
  - visualizations
  - Concept learning
  - some proc. learning

- **Desk-top VR**
  - (VRML, gaming engines)

(*) Massively multiplayer online role-playing games
8. Microworlds, simulations, rich exercising machines

- There is a rich variety
- Can sometimes be imported into a LMS or another platform
- Frequently used in technical teaching

Example: on-line syntax parser

_url:_ http://www.latl.unige.ch/
9. Teleteaching

9.1 Slides + voice applications

<table>
<thead>
<tr>
<th>Activation of text chat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video (sometimes)</td>
</tr>
<tr>
<td>User list and discussion mgmt. (voice chat)</td>
</tr>
<tr>
<td>Window for slide presentations</td>
</tr>
</tbody>
</table>
9.2 Centra "virtual class solution" (MS only)

Agenda (with slides)

Discussion management

Slides & Shared Applications & Shared Whiteboard
9.3 Other alternatives

• Mass market text and voice/video chat
  • e.g. MS Messenger

• High-end video-conferencing systems
  • Video/voice quality adapted to client
  • Application sharing (Microsoft)
  • Slide presentation management
  • Document camera
  • Special video rooms with feedback cameras/screens
  • ....

• Peer-to-peer groupware
  • e.g. Groove
10. CSCL (Computer supported collaborative learning)

- Collaborative learning can be very powerful
- needs scenario-building (story-boarding)

1. Socio cognitive conflict
2. alternative propositions
3. (auto-)explanation
4. interiorisation
5. abstraction
6. sharing of cognitive load
7. mutual regulation
8. negociation and co-construction
10.1. Locally made (at Tecfa)
The ArgueGraph scenario
• Goal: Support conceptual learning
Scenario:
1. Students answer survey
2. Discussion on summary information
3. Collaborative fill in
   • Teacher selects opposite pairs
   • Pairs argue and answer survey again
4. Discussion
5. Synthesis (HomeWork)
   • Each student writes a text
The Iconometer

• Test icons used in web pages
• Learn about multiple meanings

Scenario

1. Look at an icon
2. Formulate hypothesis
   • one or several
   • each with a confidence factor
   • total must not exceed 100%
3. Look at results
   • Look at each hypothesis
   • Look at summary information
4. Discuss ....
10.2. Platform Example: "Knowledge Forum"

http://www.knowledgeforum.com

Open Source and Freeware examples: DREW, CoolModes, ....
11. Groupware and CSCW

11.1 Overview

- Sometimes an alternative to the C3MS presented before
  - less focus on system supported production
  - less community building features

- Typical features
  - document management: file-exchange, file management
  - asynchronous communication tools (forums)
  - user management and access control

- Not so typical
  - (sometimes) application sharing
  - workflow support and roles definitions
  - less focus on system supported production
11.2. Typical example: BSCW - http://bscw.fit.fraunhofer.de/
12. Weblogs

- Diary for interesting information and ideas
- Propagation mechanisms of good ideas through "blogosphere"
- Learn by "look", write, exchange, confront, ...

During my holidays I read a very relevant book (in french) about innovation and how to invent futuristic stuff: Fabriquer le futur : L'imaginaire au service de l'innovation by Pierre Musso, Laurent Pontbriand, Eric Saulliez. The book is well connected to the France Telecom/Orange/Wanadoo galaxy (the prototype is handled by France Telecom R&D boss), which is cool because as I already stated here it's difficult to get some information about this company does. It is a pity since I know that there is plenty of valuable research there.

Back to the book, the authors offer a review about how the design of futuristic applications are carried out. They also advocates for more user-centric approaches. I won't go too much into the detail now because I don't have time for that. I will rather wait a bit and put my notes next week about it. Diana whether I'll have enough time to write the notes in french or english. I'll see.

Besides, one of the author also has a blog: e-mergences which offers a nice follow-up to the book.
13. Content & Document Management Systems

- A CMS can be used to edit & organize contents through the web
- Note: most LMS have simple (IMS/Scorm) CMS functionality
- A CMS can also be used as write-to-learn tool for students

http://www.spip.net/
- open source CMS
14. The Wiki way

14.1 Definition and usage forms

Features

• Through the Web editing with simple markup or Wysiwyg
• Autolinking of terms (each term that correspond to a page name)
• Versioning control and tracking

Some usage patterns

1. Collaborative documentation tool (e.g. programmers teams),
   • related to life-long and organizational learning
2. Students write (also: collaborate, discuss, confront, link)
   • Write-to-learn strategies
   • Support for exploratory, inquiry-based scenarios
3. Large collective encyclopedias
   • Useful for resource-based teaching scenarios
   • \texttt{http://wikipedia.org/} has over 470’000 articles in English, many versions in other languages.
14.2 Example: Biology teaching at High school level

Cyber 4 OS : Création de cours interactive par les élèves

Réalisé au Collège Calvin avec le soutien de TECFA dans le cadre du projet TECFA Seed.

Les élèves composent eux-mêmes les pages. Elles sont donc :

- le reflet de leur maîtrise actuelle du sujet
- une mémoire pour la continuité du cours
- un outil de travail collaboratif
- un outil de construction de ces connaissances
- le produit concret du projet materialisant leurs efforts

Il Neurobiologie Accueil

Du neurone au comportement humain.

De janvier à fin mai

• Several long-term experiments: Ecology, Neurobiology, Anatomy, Reproduction, ...
• Each course was "story-boarded": distribution of task, collaborative and collective activities included.
15. The "help desk model" for life-long learning

Systems used: either C3MS portals, Groupware, specialized helpdesk and knowledge management software.
III Conclusions

Think!

Make scenarios
(story boarding)
16. Three key elements

Focus on communication when you start delivery planning (costs are NOT constant)
17. Make sure that technology fits your needs

<table>
<thead>
<tr>
<th>Technology (is not innocent !!)</th>
<th>Teaching I &quot;know-that&quot;</th>
<th>Teaching II &quot;know-how&quot;</th>
<th>Teaching III &quot;knowing-in-action&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-learning Systems</td>
<td>***</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Hypertext, Wikis, CMS (exploring, reading)</td>
<td>***</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Groupware (help desk, discussion)</td>
<td>*</td>
<td>***</td>
<td>**</td>
</tr>
<tr>
<td>Microworlds (exercising, simulating)</td>
<td>***</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Hypertext, Wikis, CMS (producing, collaborating)</td>
<td>**</td>
<td>*</td>
<td>***</td>
</tr>
<tr>
<td>C3MS</td>
<td>*</td>
<td>*</td>
<td>***</td>
</tr>
<tr>
<td>CSCL</td>
<td>*</td>
<td>***</td>
<td>*</td>
</tr>
</tbody>
</table>

Conclusions © TECFA 8/4/05
## Technical standards

<table>
<thead>
<tr>
<th>Data</th>
<th>behaviorist instructionalist</th>
<th>socio-constructivist activity-based</th>
</tr>
</thead>
<tbody>
<tr>
<td>metadata, quizzing, packaging, simple sequencing learning design (new) learning objectives</td>
<td>metadata structured text (XML) Internet formats (activity-design is under preparationS !)</td>
<td></td>
</tr>
<tr>
<td>IMS compliant Learning Content &amp; Management Systems, Teleteaching</td>
<td>portals, web services, (API’s for portal bricks), User CMS &amp; wikis, isolated groupware, CSCW Systems, CSCL Systems, ......</td>
<td></td>
</tr>
</tbody>
</table>