Apports et limites des langages de modélisation pédagogique dans les situations de formation hybrides

Jean-Philippe PERNIN (*) ,(**)

(*) Institut national de recherche pédagogique ERTé e-Praxis
(**) Laboratoire CLIPS-IMAG, Grenoble
Genesis of IMS Learning Design Proposition

- Lyon, INRP, 13th June, presented by C. Tattersall

**Open University NL**
- First student in September 1984
- Government-funded institute for distance learning at university level.
- Goal: to make higher education accessible to anyone with the necessary aptitudes and interests, regardless of formal qualifications.
  - to create a cost-effective form of higher education,
  - to encourage innovation in Dutch higher education, in terms of both curriculum and teaching methods,
  - to reduce the teacher shortage in Dutch primary and secondary schools, and
  - to be a recognized player in distance and e-learning training programmes and consultancy.

**The Quest**
- Can we describe these learning events in a generic way?
- Can we make a generic description of all
  - the learning & support activities,
  - including the environment in which they take place?
- => search for a notation of the teaching-learning process in a Unit of Learning (e.g. a course, workshop, event, ...)

**We have a notation**
- And it's at the heart of an open technical specification
- But doesn't tell us
  - how to record/create the notation
  - how to adapt/edit the notation
  - how to aggregate several notations
  - how to use the notation
- More work needed
But...

- Is this notation really neutral?
- Is it related to a certain point of view about education?
- Is it related to a specific context (distance) of “e-learning” in higher education? Can it be disseminated in a large range of contexts?

- Importance of conceptual metamodel and underlying concepts. For example:
  - Theatrical metaphor
  - Levels A, B and C
  - Conditions and property concepts VS role and activity
  - Suggested lifecycle in Best Practice Guide
    - Narrative, UML semi-formal, LD notation

- Some answers have been provided by Rob Koper this morning
What future for long life learning?

- Long-life (digitally instrumented) learning
  – Several scenarios are possible…
  – Depends on socio-cultural choices
A first question

• We have learnt during 3000 years without learning design!

• Why to model Learning situations?
  – To share practices between communities, to improve ways of learning?
  – To answer to new socio-technical paradigms?
    • Long life learning?
    • Complex digitally instrumented learning situations?
  – To face the challenge of “mass teaching”?
    • economical reasons? Rationalization?
  – To solve problems due to progressive diminution of human facilitators (teachers, tutors, etc.)
    • Transfer regulation process from human to computers
Other questions about modeling of learning situations

- For what purpose?
  - Knowledge, competences?
- Who prescribes and organizes activities?
  - Institution, teacher, Instructional designer
  - Negotiation between different actors
  - Learner itself
- When activities are organized or reorganized?
  - before
  - on the fly
- For what kinds of situations?
  - Distance, face to face, hybrid
  - At school, at home, at workplace
  - Audience (primary, secondary, university, professional, individual, etc.)
- With what kind instruments?
  - Digital or/and not digital
  - Predefined or progressively enriched technical environments
Long Life Learning at primary school

GOALS?

- Learn basic competences
- Learn basic culture
- Learn to learn
- Learn to be a citizen

WHERE AND WHEN?
- Classroom
- Home schooling
- Para schooling

WHO PRESCRIBES?
- Institution
- Parents
Long Life Learning at secondary school

GOALS?

Same than in primary + Learn to be an efficient professional + Learn to be a “honnête homme”

WHERE AND WHEN?

Classroom
At home
Para schooling
Within learner communities

WHO PRESCRIBES?

Institution
Parents
Learners
Market
Long Life Learning at university

GOALS?

Same than in secondary

Learn to be an efficient professional

WHERE AND WHEN?

At university
Distant learning
Within learner communities

WHO PRESCRIBES?

Students
Institution
Corporates

Introduction
Learning
Design: why?
Long life learning situations
Propositions
Long Life Learning at workplace

GOALS?

Learn to be a more efficient professional

WHERE AND WHEN?
- At workplace
- At home
- With colleagues

WHO PRESCRIBES?
- Corporates
- Worker

Introduction
Learning Design: why?
Long life learning situations
Propositions
Long Life Learning at home

GOALS?

Explore new fields, master new competences

WHERE AND WHEN?

At home
Within community of interest

WHO PRESCRIBES? Individual
Manage complexity...

Activity systems

Instrumental systems

Importance of situations

J.P. Pernin
Situated learning

- A large diversity of:
  - Goals
  - Prescriptors
  - Actors
  - Situations
  - Instrumental systems

- A learning situation
  - Is motivated by a didactical intention or agreement
  - Is located in a social environment
  - Is located in a technical environment

- A learning design
  - cannot be reduced to define relationships between a learner, activities and a predefined technical environment
  - Is a dynamic process resulting of negotiation

- About learning environments...
Instrumental genesis theory (1)

Introduction

Learning Design: why?

Long life learning situations

Propositions
Instrumental genesis theory (2)

- (Rabardel, Pastré 2005)
- Two dual process
  - User’s instrumentation
    - User builds the more coherent set of instruments adapted to his task
  - Artifact's instrumentalization
    - Adjusting artifact and its functions to a specific context
- Design of artifacts is shared between designers and users
- Design of artifacts is a continuous process
- Artifacts are organized by users in coherent “instrumental systems”
Consequences on Learning Design

• Learning Design
  – is shared between designers and users
  – is a continuous process

• The organization of activities
  – a priori, can be only “roughly” defined
  – Is dynamically refined and adapted at runtime

• The physical environment (= instrumental system)
  – a priori, can be only indicatively defined
  – is digital or not
  – is enriched by results of activities
  – is adapted and customized by each user
Collecting practitioners needs

- **CAUSA Project** (start: October 2005)
  - Collecting and Analyzing Uses of Scenarization of Activities (in francophone area)
  - Leader: INRP (National Institute for Educational Research) – ERTé e-Praxis (Grenoble, Lyon)
  - Pluridisciplinary team (researchers, teachers, engineers)
    - Education Science
    - Computer science
    - Didactic specialists

- Focus contexts:
  - primary, secondary, university, continued training
Workshops for teachers and instructional designers
(14 people / each workshop)
Outcomes (produced by teachers)
Questionnaire : first results (provisional)

- Web questionnaire
  - Diffused on specific mailing lists
  - 40 questions (20 MCQ, 20 open questions)
  - One hour required to answer
  - Partially based on an example of scenario given by the user
  - In three weeks : more than 130 answers (each one with its own example of scenario)
Population and context (131 answers)

- **Engineer / Staff**: 24%
- **Teacher and trainer**: 76%

- **Primary school**: 35%
- **Secondary school**: 34%
- **University**: 10%
- **Teacher Training**: 21%

- **Use of computer**
  - **Exclusive**: 14%
  - **No use**: 13%
  - **75% to 99%**: 18%
  - **50% to 75%**: 11%
  - **25% to 50%**: 25%
  - **<= 25%**: 19%

- **Method of use**
  - **Face to face**: 25%
  - **Distant**: 57%
  - **Hybrid**: 18%
Granularity and duration

- Sequence: 28%
- Module or course: 28%
- Session: 24%
- Isolated activity: 13%
- Curriculum: 2%
- Year: 5%
- Organization: 5%
- From several minutes to one hour: 19%
- One or several hours: 37%
- On or several days: 23%
- One or several months: 18%
- One or several years: 3%
Importance of collaboration and adaptation

Degree of collaboration

- Dominating: 59%
- Punctual: 31%
- Non-existent: 6%
- Exclusive: 4%

Adapted at runtime

- Yes: 72%
- No: 28%
Visibility of scenario at runtime

Visible by tutor

Visible by learner

<table>
<thead>
<tr>
<th>Answer</th>
<th>Tutors</th>
<th>Learners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visible</td>
<td>78%</td>
<td>67%</td>
</tr>
<tr>
<td>Not Visible</td>
<td>22%</td>
<td>33%</td>
</tr>
</tbody>
</table>
Form of described scenarios

- **Form of described scenarios**
  - Figures and schemas: 23%
  - Structurated text: 28%
  - Form: 27%
  - Brief notes: 14%
  - Others: 8%

- **Kind of support**
  - Rules shared within a community of practice: 44%
  - Personal rules: 32%
  - Standardized language: 16%
  - No rule: 8%
  - Brief notes: 14%

**With what rules?**
Proposed conceptual framework (adapted from R. Koper, to be discussed)

Learning scenario
- represents Activity organization
- is dynamic
- is linked to didactical intentions

Organizes structural and temporal relationships between entities

**Didactical level**
- Current knowledge
- Didactical intention
- Targeted knowledge

**Activity and Social environment**
- Role
- Activity
- Recipient

**Physical environment**
- Resource
- Knowledge manipulation
- Tool
- Service
- Production
- Trail

*implied by*

*is motivated by*
Learning situation’s characteristics

- Multiple interactions between humans and computer
  - Activity systems must be adaptable and customizable
  - Instrumental systems must be adaptable and customizable
- Learning activity prescription and regulation result from a didactical intention
  - Activity systems must be related to didactical intentions
- Identify:
  - process: scenarization
  - Intermediary results: progressively enriched and adapted forms of the learning scenario
A learning scenario: our proposition

Introduction

Learning Design: why?

Long life learning situations

Propositions
Assist prescriptors in regulation

- Can be predefined and automated by rules
- Can be performed by humans “on the fly”
User tools

- User tools for:
  - Prescription
    - Design abstract scenarios
    - specific authoring tools
  - Contextualization
  - Observation at runtime
  - Regulation at runtime
    - Adapt organization of activities
    - Adapt instrumental systems
  - Link regulation to didactical intention (If possible)
Scenarization: an incremental process

**Pedagogical contextualisation**
- Refinement
- Role Affectation
- Planning
- Precise definition of resources, tools and services

**Design Loop**

**Technical implementation**
- Projection towards a LMS

**Evaluation/De-contextualisation**

**Reutilization Loop**

**Execution/adaptation**

**Adaptation Loop**

**Propositions**

Introduction

Learning Design: why?

Long life learning situations
Scenarization: an incremental process

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**Technical implementation**
- Projection towards a LMS

**Design Loop**
- Runnable scenario
- Contextualized scenario

**Didactic and pedagogical initial design**
- Abstract scenario

**Execution/adaptation**
- Effective Scenario

**Adaptation Loop**

**Evaluation/De-contextualisation**
- Reusable scenario

**Reutilization Loop**

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J.P. Pernin

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