Content

*Paper:* Developing advanced units of learning using IMS Learning Design level B [http://hdl.handle.net/1820/333](http://hdl.handle.net/1820/333)

• Introduction to LD level B  
  - Properties  
  - Global Elements  
  - Monitor Service  
  - Conditions  

• Examples of advanced pedagogical functions  
  - Active and Collaborative learning  
  - Adaptive learning and personalisation  
  - Conditional text and runtime tracking  
  - ePortfolio's and new forms of assessment
From Level A to level B

Level B Adds **dynamics** to the learning design:

- adaptation of activities, plays, etc.
- adaptation of external resources
- digital portfolio's
- advanced sequencing
- model new and classical forms of assessment
- change content in runtime through properties
- ask input from users, support interactions for collaborative learning
- calculations
- ...

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Assignment: Example

• (2 minutes) think of an example where you can use 'dynamics' in your own educational setting (or a specific one you can think of).
Level B relates to 2 LD Requirements

- R1: completeness
- **R2**: pedagogical flexibility (extended)
- **R3**: Personalization (realised)
- R4: Formalization
- R5: Reproducibility
- R6: Interoperability
- R7: Compatibility
- R8: Reusability

Level A realises R1, R4..R8, but partially R2 and very limited R3
Level B realises R3 and extends R2 to a large extend
Level C realises R2
Properties: Why properties?

- Create user models for adaptive learning
- Ask and store user information (e.g. portfolio info)
- Add new information at runtime (e.g. teacher adds information at runtime to be read by students)
- Show information that has been added at runtime by the users (e.g. opinions, discussion conclusions)
- Use information that has been stored in another unit of learning (e.g. completion of previous activities)
- etc.
Property types

1. Local Properties (*loc-property*)
2. Local Personal Properties (*locpers-property*)
3. Local Role Properties (*locrole-property*)
4. Global Personal Properties (*globpers-property*)
5. Global Properties (*glob-property*)

+ Property Groups (*property-group*)
Five types of Properties

* Roles are local, not global
Run 1 UOL 1

A
- lpp-testscore="A"
- gpp-language="English"

B
- lpp-testscore="B"
- gpp-language="French"

C
- lpp-testscore="C"
- gpp-language="German"

role = “group1”
lrp-points="1"

role = “group2”
lrp-points="6"

lp-start-time="20-4-2005"
gp-institute="Univ A"

lpp = locpers-property
gpp = globpers-property
lrp = locrole-property
lp = loc-property
gp = glob-property
Assignments:
1. Write down all the properties and values person A & C have access to.
2. In Run 2 of UOL 1
   Draw properties like above
3. In Run 1 of UOL 2
   Draw properties like above
Global Elements: Why global elements?

- Set property values in the context of a resource
  Enter your email address: john.paper@abc.edu
  Enter a course introduction: Hello my name is John, and I am your..
- Create questions (e.g. surveys)
  Who is the Queen of Luxembourg?
  a. Beatrix
  b. Christina
  c. No Queen
  Answer: c
- View runtime added content in a resource context
  Course introduction: [[runtime included text:]]
  Hello my name is John, and I am your tutor for this course. When you have any questions, please contact me at john.paper@abc.edu
  The first activity you have to perform is .... [[standard text]]
Four global elements

1. view-property
2. view-property-group
3. set-property
4. set-property-group
Declare, set and view properties

- *Declare* properties in the context of the learning design (can set a default value)
- *Set* property values in an external XML resource using global elements
- *View* property values in an external XML resource using global elements
Declare property

<learning-design>
    ....
    ....
    <components>
        ...
        <properties>
            <loc-property/>  {for details see schema}
        </properties>
        ...
    </components>
    ....
</learning-design>
Set property

XHTML resource:

```xml
<xhtml>
  <p>Type your Name?</p>
  <imsld: set-property ref="name"/>
</xhtml>
```

-------------------Interface---------------------

What is your name?  [ Rob     ]
View Property

XHTML resource:

<xhtml>
  <p>Your Name is:</p>
  <imsld: view-property ref=”name”/>
</xhtml>

----------------Interface-----------------

Your Name is:  [ Rob ]
Monitoring: Why monitoring?

- Teacher tracks the performance of the group
- Students access the results of fellow students
- Look at your own portfolio
- Look at selected items from portfolio of others
- Aggregate a list of opinions that have been entered by each individual student
- ...

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Declare monitor service

<environment>
  <service>
    <monitor>
      <role-ref ref="student-groups"/>
      <item identifier="X" identifierref="Y"/>
    </monitor>
  </service>
</environment>

<resource identifier="Y" type="imsldcontent" href="Monitor.xhtml">
  <file href="Monitor.xhtml"/>
</resource>
Define the monitor content

Create XHTML file with embedded global elements to view property values

<xhtml>
  <p>The results of all the subgroups:</p>
  <imsId: view-property property-of="supported-persons" ref="report"/>
</xhtml>
Example

- Upload the report of your subgroup:
  - c:/txt/report2.doc
  - [Browse...]

- The results of all the subgroups:
  - Report1.doc
  - Report2.doc
  - Report3.doc
  - <no value>

stored in locpers-property

read the locpers-property for all persons in the role student-groups
Conditions: Why conditions?

- Show or hide activities, structures, plays depending on the property values
- Show or hide content in external XML files depending on property values
- Calculate values (e.g. test results)
- Change property values when other properties values have a certain value (e.g. provide a score when a certain treshold is reached)
- Calculate timed events (after x minutes, activity y should be provided)
- ...

Conditions

If \{expression\}

THEN  Show \{class, item, environment, learning activity support-activity, activity-structure play, unit-of-learning\}  OR

Hide \{class, item, environment, learning activity support-activity, activity-structure play, unit-of-learning\}  OR

Change-property-value
Example

If \{\text{competence-level English writing} > 4 \text{ AND } \text{activity2 is completed}\}

Then Show \{\text{activity3}\}
  Show \{\text{environment4}\}
  Hide \{\text{activity-structure1}\}
Examples
Collaborative Learning

- A pedagogical approach in which students at various competency levels work together in groups towards a common learning objective.
- What functions are needed in a learning management system to support collaborative learning?
- What part of it can be modelled using IMS LD?
- See paper for a worked example.
Adaptive learning and personalization

- Aim is to personalize instruction by providing each individual learner a set of learning activities and resources that fits the individual learners properties, such as: personal learning objectives, prior knowledge, situational circumstances.
- What functions are needed in a learning management system to support adaptive and personalized learning?
- What part of it can be modelled using IMS LD?
- See paper for a worked example
Conditional Text and runtime tracking

- Aim is to add text and other information at runtime (instead of design-time only) and to track the progression of students (teacher only or peers).
- What functions are needed in a learning management system to support conditional text and runtime tracking?
- What part of it can be modelled using IMS LD?
- See paper for a worked example
ePortfolios and new forms of Assessment

• In new forms of assessment learning and assessment are integrated more than in traditional approaches. Examples: peer assessment, portfolio assessment, competence assessment.

• What functions are needed in a learning management system to support new and classical forms of assessment?

• What part of it can be modelled using IMS LD?

• See paper for a worked example
Questions, Discussion, ...