Fostering Adaptivity in E-Learning Platforms: A Meta-Model Supporting Adaptive Courses

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Motivation and Aims

- E-learning platforms are often used in e-education but they provide the same course for all learners
- Learners have different needs
- Adaptivity increase the learning progress

How to bring more adaptivity in e-learning platforms focusing on learning styles?

Basic concept:
- Author creates individual learning objects
- System composes the learning objects to different courses

→ Description saying how courses need to be designed to provide adaptivity (= meta-model)
  - Easy applicable for all platforms
  - Platforms should not lose their simplicity
Felder-Silverman Learning Style Model

Richard M. Felder and Linda K. Silverman, 1988
Each learner has a preference on each of the four dimensions
Dimensions:
- Active – Reflective
  learning by doing – learning by thinking things through
  group work – work alone
- Sensing – Intuitive
  concrete material – abstract material
  more practical – more innovative
  patient / not patient with details
- Visual – Verbal
  learning from pictures – learning from words
- Sequential – Global
  learn in linear steps – learn in large leaps
  good in using partial knowledge – need „big picture“

Strong preference but no support → problems
Supporting Learning Styles in E-Learning Platforms

- Which kinds of learning objects/activities can be used to adapt to the learning style?
- Which kinds of learning objects/activities are commonly used?
Meta-Model

Course
1..* 1..*

Chapter
1..* 1..*

Learning Unit
1..* 1..*

Learning Object

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active - reflective
sensing – intuitive
visual - verbal
sequential - global

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Chat  Forum

Test  Exercise

Example

Collection

Multimedia Object

Content Link

Content

Question

is about

describes

describes

collection

Example

Chat

Forum

Test

Exercise
A course for a global learner

Markup Languages

XML versus ...

- SGML
  - XML < SGML (60 pages vs. 600 pages)
  - XML provides 80% of the features and functionality of SGML with only 20% of its complexity
  - XML documents are compliant to an ISO revision of SGML - WebSGML (Annex to the SGML standard ISO8879)

- HTML
  - XML is complementary to HTML (Semantic and structure vs. layout)
  - XML is NOT backward compatible to HTML
  - Simple possibilities to convert from HTML to XML

- XHTML
  - HTML 4.01 is implemented as XML application, i.e. HTML is described by an XML-DTD

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A course for a sequential learner

Links

Exercises & Tests

Markup Languages

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Conclusion & Future Work

- Meta-model for supporting adaptive courses
- Describes how courses should be designed to provide adaptivity
- Easy to integrate in e-learning platforms without losing their simplicity
  - generate different course instances out of one course
  - generate a suitable course for each learner

- We have implemented the meta-model in Moodle
- Future Work:
  - Implementing a tool that generates different course instances
  - Implementing a tool that identifies the learning style of a learner
  - Extending the meta-model by including also not commonly used features