Concept Map-Based Framework for Learner-Centered Knowledge Management in ePortfolios

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Outline

- Project background
- Qualitative research and concept maps
- Framework for knowledge management
- Prototype and examples
- Future directions
Project Background

• The aim of the project: a learner-centered e-learning system that will provide students with an environment which reflects their needs as lifelong learners

• We conducted 17 in-depth semi-structured interviews with lecturers and students who used ePortfolio systems

• High priority problems: managing and organizing data into data sets, tracking personal learning progress, sharing ePortfolio content with others and making sense of graduate attributes that represent the core learning outcomes, skills and qualities

• In this work we aim to introduce a potential way of addressing these problems by incorporating a concept map-based framework as a tool for knowledge management into the ePortfolio space
Parallels to Qualitative Research

- ePortfolio process
- Qualitative analysis process
- Qualitative analysis support software (NVivo, MAXQDA)
- Current approaches in ePortfolio systems
**Concept Maps**

- **Definition:**
  - “A directed acyclic graph that consists of a set of Concept Labels and a non-empty set of Relationships between Concepts” (McAleese, 1998)
  - “Graphical representation of the hierarchy of knowledge concepts and connections between them” (Novak, 2008)

- Already successfully used in education to communicate complex ideas, assess understanding of learning objectives, elicit knowledge and provide conceptual frame for learning
A Proposed Framework for Learner-Centered Knowledge Management
Framework Applied to an Example

- Complex Thinking
  - Classification
    - Ability to specify useful categories to which items will be sorted
    - Video sample 2
  - Decision Making
    - Ability to specify important defining characteristics of the categories
    - Video sample 1
    - Ability to identify alternatives to be considered
    - Blog entry 2
    - Ability to identify criteria for alternatives
    - Blog entry 1
    - Ability to make a selection that meets the decision criteria
    - Doc sample
    - Video file: Conference presentation 2008
    - Blog: Research project
    - Doc file: River pollution project

* Each example is supported by reflection and optional custom time tag

Concept level

Repository level
Prototype Implementation

- ePortfolio system Mahara - http://mahara.org
  - Open-source system
  - Modular and extensible
- Javascript + HTML5 standard
  - Increasingly supported by the majority of browsers
  - User interaction with graphics (concept maps)
  - Creating dynamic timeline
  - Access artefacts’ fragments (audio, video)
Prototype Implementation

Concept Map
## Prototype Implementation

**Timeline**

### Map 'Map Testing'

Switch to Concept Map

Select time frame: Month  
Select concept: Map Testing

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<tr>
<th>Aug-2009</th>
<th></th>
<th>Feb-2010</th>
<th></th>
<th>Sep-2010</th>
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<tr>
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<td>Example 8 (image)</td>
<td><img src="image" alt="Example 6" /></td>
<td>Example 6 (image)</td>
<td><img src="image" alt="Example 5" /></td>
<td>Example 5 (text)</td>
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<td><img src="image" alt="Example 9" /></td>
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<td><img src="image" alt="Example 4" /></td>
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<table>
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<th>Apr-2011</th>
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<tr>
<td><img src="image" alt="Example" /></td>
<td>Example 8 (image)</td>
<td></td>
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</tr>
</tbody>
</table>
Prototype Implementation

Artefact’s Fragment

Edit Fragment

Step 1. Select image fragment

You can select an image fragment in a usual way: press the left mouse button, drag cursor, release the button.

Enable downloads

Check this box if you want others to be able to view and download an entire file.
Expected benefits of the framework implementation:

- Manage and structure large amounts of information in their ePortfolio
- Track personal progress in various areas and aspects
- Share their progress/development map with others for feedback or evaluation
- Access and address institutional graduate attributes
- Develop a flexible structure for self-directed learning
- Facilitate setting up learning/development goals and expressing students visions of their knowledge
Conclusions and Future Directions

• Potential way of delivering graduate attributes in a form that would be understood and accepted by students
• Help students look at their study from the lifelong learning perspective
• Aid in organizing and managing evolving data in ePortfolios
• Current main goals:
  • Prototype refining based on feedback
  • Evaluation using case studies
Questions?