Digital Library Curriculum Development:

Enhancing Education and Comprehension of NDLTD

Edward A. Fox, Seungwon Yang, Barbara M. Wildemuth, Jeffrey Pomerantz

ETD 2006, Quebec Canada
NDLTD Goals

• **For Students:**
  – Gain knowledge and skills for the Information Age
  – Richer communication (digital information, multimedia, …)

• **For Universities:**
  – Easy way to enter the digital library field and benefit thereby

• **For the World:**
  – Global digital library – large, useful, many services
Curriculum Development Project

- Collaborative Research launched by:
  - Department of Computer Science, Virginia Tech
  - School of Information and Library Science, University of North Carolina, Chapel Hill
- Three year (2006 - 2008) funded project
- Partly help achieving NDLTD goals
Project Teams/NSF Grant

• Project Team at VT (IIS-0535057):
  – PI: Dr. Edward A. Fox (fox@vt.edu)
  – GRA: Seungwon Yang (seungwon@vt.edu)

• Project Team at UNC-CH (IIS-0535060):
  – Co-PI: Dr. Barbara Wildemuth (wildem@ils.unc.edu)
  – Co-PI: Dr. Jeffrey Pomerantz (pomerantz@unc.edu)
  – GRA: Sanghee Oh (shoh@email.unc.edu)
Project links

• Homepage
  http://curric.dlib.vt.edu/DLcurric.html
  - overview, other links, progress diary, news & interviews

• Project progress diary
  - discussion summaries, meeting pictures, events, announcements
News and Interviews

- WVTF Public Radio: Morning Edition, "Interview with Dr. Fox" [January 30, 2006]
- VT Collegiate Times article [January 26, 2006]
- UNC Gazette article [January 25, 2006]
- Virginia Tech Computer Science Department News article [January 23, 2006]
- Virginia Tech News article [January 20, 2006]
Development / Evaluation Plan
January 2006 – December 2008

Vision/plan
- From research team (VT & UNC)
- From current courses at VT & UNC
- From Advisory Board
- From CC 2001

Design
- Modules
- Lessons

Analyze
- CC 2001 context
- Curricular needs
- Student background

Evaluate
- Inspection by Advisory Board
- Inspection by external experts
- Inspection by Doctoral Consortium participants

Evaluate in the field
- Teacher perceptions
- Student perceptions
- Student outcomes

Feedback
- Specific strengths
- Specific weaknesses

Revise & Implement
- Modules ready for use
- Lessons ready for use

Products
- At UNC & VT
- At additional universities (in CS & LIS programs)

Evaluate
- From research team (VT & UNC)
- From current courses at VT & UNC
- From Advisory Board
- From CC 2001
<table>
<thead>
<tr>
<th>Activities</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creation of an advisory board</td>
<td>Su</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engagement of experts to assist with module development</td>
<td></td>
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<td></td>
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<tr>
<td>Development of modules</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of lessons within modules</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of 1- and 2-semester courses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preliminary evaluation of modules and lessons by experts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revision of modules and lessons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation of modules and lessons in existing courses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluation of modules and lessons in the field</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offering of new courses at UNC &amp; VT</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ETD, JCDL and Doctoral Consortium</td>
<td>Sp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECDL &amp; SIGIR conferences</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ASIS&amp;T conference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICADL conference</td>
<td></td>
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</tbody>
</table>
What we do:

- Identify, develop and test educational DL modules, guided by
  - Experts and international collaborators
  - Computing Curriculum 2001 [6, 7]
  - 5S framework [1,2,3,4]
    (Ex) Module revision in 3/27/06
  - Analysis of DL course syllabi
    (Ex) UNC-CH is collecting DL syllabi
    VT collected syllabi from DELOS member institutions in Europe
  - Development of module template
### Experts / Advisory board members

<table>
<thead>
<tr>
<th>Advisory Board</th>
<th>VT</th>
<th>UNC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dan Atkins, U. Michigan</td>
<td>Steven Edwards, CS</td>
<td>Catherine Blake, SILS</td>
</tr>
<tr>
<td>Christine Borgman, UCLA</td>
<td>Roger Ehrich, CS</td>
<td>Laura Gasaway, Law School</td>
</tr>
<tr>
<td>Lillian Cassel, Villanova</td>
<td>Weiguo Fan, ACIS</td>
<td>Jane Greenberg, SILS</td>
</tr>
<tr>
<td>Michael Christel, CMU</td>
<td>Steve Harrison, CS</td>
<td>Stephanie Haas, SILS</td>
</tr>
<tr>
<td>Raya Fidel, U. Washington</td>
<td>Gail McMillan, Library</td>
<td>Brad Hemminger, SILS</td>
</tr>
<tr>
<td>Richard Furuta, Texas A&amp;M University</td>
<td>Chris North, CS</td>
<td>Thomas James, Dean, School of Education</td>
</tr>
<tr>
<td>Elizabeth Liddy, Syracuse University</td>
<td>Manuel Pérez-Quiñónez, CS</td>
<td>Paul Jones, Director, ibiblio; SILS &amp; School of Journalism &amp; Mass Communication</td>
</tr>
<tr>
<td>Clifford Lynch, CNI</td>
<td>Naren Ramakrishnan, CS</td>
<td>Diane Kelly, SILS</td>
</tr>
<tr>
<td>Kurt Maly, ODU</td>
<td>Deborah Tatar, CS</td>
<td>Gary Marchionini, SILS</td>
</tr>
<tr>
<td>Javed Mostafa, Indiana</td>
<td>Layne Watson, CS</td>
<td>Montek Singh, CS</td>
</tr>
<tr>
<td>Tefko Saracevic, Rutgers</td>
<td></td>
<td>Natasha Smith, Library</td>
</tr>
<tr>
<td>Linda Smith, UIUC</td>
<td></td>
<td>Helen Tibbo, SILS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Steve Weiss, CS</td>
</tr>
</tbody>
</table>
Selected International Collaborators

• India
  Dr. Arun Kumar Chakraborty
  – Bose Institute, Kolkata, India

• Brazil
  Dr. Ricardo da Silva Torres
  – State University of Campinas (UNICAMP), SP, Brazil
What we do:

- Identify, develop and test educational DL modules, guided by
  - Experts and international collaborators
  - Computing Curriculum 2001 \cite{6,7}
  - 5S framework \cite{1,2,3,4}
    (Ex) Module revision in 3/27/06
  - Analysis of DL course syllabi
    (Ex) UNC-CH is collecting DL syllabi
    VT collected syllabi from DELOS member institutions in Europe
  - Development of module template
<table>
<thead>
<tr>
<th><strong>CC2001 Information Management Areas</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IM1. Information models and systems</strong>*</td>
</tr>
<tr>
<td><strong>IM2. Database systems</strong>*</td>
</tr>
<tr>
<td><strong>IM3. Data modeling</strong>*</td>
</tr>
<tr>
<td><strong>IM4. Relational DBs</strong></td>
</tr>
<tr>
<td><strong>IM5. Database query languages</strong></td>
</tr>
<tr>
<td><strong>IM6. Relational DB design</strong></td>
</tr>
<tr>
<td><strong>IM7. Transaction processing</strong></td>
</tr>
</tbody>
</table>
What we do:

• Identify, develop and test educational DL modules, guided by
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  - Development of module template
5S Framework

• Developed by Digital Library Research Laboratory (DLRL) at Virginia Tech
• Strong foundation for DL module development
• Captures entities and medium involved in DLs.
• The five S’s
  - streams, structures, spaces, scenarios, societies
5S Framework

- **Streams**
  - All types of contents
    (as well as communications and flows over networks, or into sensors, or sense perceptions)
- **Structures**
  - Organizational schemes
    (including data structures, databases, and knowledge representations)
5S Framework

• “Spaces”
  - 2D and 3D interfaces, GIS data, representations of documents and queries.

• “Scenarios”
  - System states and events, but also can represent situations of use by human users (or machine processes, yielding services or transformations of data).

• “Societies”
  - Both software “service managers” and fairly generic “actors” who could be (collaborating) human (users).
## 5S Examples

<table>
<thead>
<tr>
<th>SS</th>
<th>Examples</th>
<th>Formalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streams</td>
<td>Text; video; audio; image</td>
<td>Sequence (list)</td>
</tr>
<tr>
<td>Structures</td>
<td>Collection; catalog; hypertext; document; metadata</td>
<td>Graph, Function, Relation</td>
</tr>
<tr>
<td>Spaces</td>
<td>Used in indexing, browsing, and searching services – as well as interfaces</td>
<td>Set (vector, topological, measurable, measure, probability spaces)</td>
</tr>
<tr>
<td>Scenarios</td>
<td>Searching, browsing, recommending</td>
<td>States, events, sequences (lists)</td>
</tr>
<tr>
<td>Societies</td>
<td>Service managers (software), Actors (learners, teachers, etc.)</td>
<td>Tuple (relating events and actions)</td>
</tr>
</tbody>
</table>
DL Topics in 19 Modules (original)
Module Revision in 3/27/06
Organized using 5S framework

STREAM
1. Collection Development
   – Digitization
   – Document and E-publishing Markup
   – Harvesting
2. Digital objects/Composites/Packages
   – Text Resources
   – Multimedia streams/structures, Captures/representation, Compression/coding
     • Content-based analysis, Multimedia indexing
     • Multimedia presentation rendering

STRUCTURE
3. Metadata, Cataloging, Author submission
   – Thesauri, Ontologies, Classification, Categorization
   – Bibliographic information, Bibliometrics, Citations
4. Architecture (agents, buses, wrappers/mediators), Interoperability
Module Revision 06/01/06

SPACE
5. Spaces (conceptual, geographic, 2/3D, VR)
   - Storage
   - Repositories, Archives

SENARIOS
6. Services (searching, linking, browsing, etc.)
   - Info needs, Relevance, Evaluation, Effectiveness
   - Search & search strategy, Info seeking behavior, User modeling, Feedback
   - Routing, Filtering, Community filtering
   - Sharing, Networking, Interchange
   - Info summarization, Visualization

7. Archiving and preservation integrity (ILS)

SOCIETIES
8. Intellectual property rights management, Privacy, Protection (watermarking) (ILS)

9. Social issues / Future DLs
What we will do:

• Each module will include
  - Topics
  - Lesson plan
  - Concept maps
  - Recommended reading list
  - Demos / online resources
  - Exercises and quizzes

The first will be developed during this summer…
What we will do:

• Course Development (summer 2006)
  - 1-semester and 2-semester courses will be based on the developed modules

• Courses and modules will be...
  - Evaluated by experts
  - Pilot-tested in CS and LIS courses by the U.S. institutions and our international collaborators in India (Dr. Arun Kumar Chakraborty) and Brazil (Dr. Ricardo da Silva Torres).
# Dissemination Efforts

<table>
<thead>
<tr>
<th>Conference</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>JCDL 06</td>
<td>Curriculum Development for Digital Libraries (paper)</td>
<td>Accepted</td>
</tr>
<tr>
<td>ETD Symposium 06</td>
<td>Digital Library Curriculum Development: Enhancing Education and Comprehension of NDLTD (paper)</td>
<td>Accepted</td>
</tr>
<tr>
<td>ICADL 06</td>
<td>Collaborative Research: Community-Oriented Curriculum Development for Digital Library Education (paper)</td>
<td>Planned</td>
</tr>
</tbody>
</table>
Ascertaining Priority Topics

• We’ve manually classified and analyzed publications using 9-Modules(revised):

<table>
<thead>
<tr>
<th>Source</th>
<th>Count</th>
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</thead>
<tbody>
<tr>
<td>Proceedings</td>
<td>354</td>
</tr>
<tr>
<td>ACM DL ’96 – ’00</td>
<td>189</td>
</tr>
<tr>
<td>D-Lib ’95 – ‘06</td>
<td>521</td>
</tr>
<tr>
<td>JCDL, ACM DL, ECDL</td>
<td>264</td>
</tr>
</tbody>
</table>
Distribution of Conference Papers across Module Topics

Number of conference papers

Module ID

JCDL 05
JCDL 04
JCDL 03
JCDL 02
JCDL 01
ACM DL 00
ACM DL 99
ACM DL 98
ACM DL 97
ACM DL 96

Module 1
Module 2
Module 3
Module 4
Module 5
Module 6
Module 7
Module 8
Module 9
• Analysis Results:

- Total of 543 proceedings:
  Most popular topics were architecture (module 4) and services (module 6)
• Analysis Results:

- Total of 521 articles:

  Most popular topics were
  
  architecture (module 4), services (module 6)
  and social issues (module 9)
Distribution of Session Titles across Module Topics

<table>
<thead>
<tr>
<th>Module ID</th>
<th>JCDL &amp; ACM DL</th>
<th>ECDL</th>
<th>ICADL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>5</td>
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<td>9</td>
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<td>4</td>
<td>11</td>
<td>9</td>
<td>8</td>
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<td>5</td>
<td>13</td>
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<td>8</td>
<td>19</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>9</td>
<td>21</td>
<td>19</td>
<td>18</td>
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</table>
• Analysis Results:

- Total of **264** session titles (JCDL, ECDL, ICADL): Most popular topic was services (module 6) followed by architecture (module 4)
What we do:

• Identify, develop and test educational DL modules, guided by
  - Experts and international collaborators
  - Computing Curriculum 2001
  - 5S framework
    (Ex) Module revision in 3/27/06
  - **Analysis of DL course syllabi**
    (Ex) UNC-CH is collecting DL syllabi
    VT collected syllabi from DELOS member institutions in Europe
  - Development of module template
Resource Analysis
- European DL course syllabi -

• DL-related course syllabi were collected from
  - DELOS member institutions (Austria, Czech Republic, United Kingdom, Switzerland, Norway, and Germany)

• English resources (reference papers, textbooks, online demo) were retrieved from the syllabi and organized into tables.

• We will expand this effort to include courses in the U.S., Asia, and Oceania.
Example

DL-related courses, and their resources (selected)

<table>
<thead>
<tr>
<th>Country</th>
<th>University / Institution</th>
<th>Course Title</th>
<th>Books</th>
<th>Papers</th>
<th>Online</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Institute for Information Systems and Computer Media - IIICM</td>
<td>Multimedia Information Systems 2</td>
<td>0</td>
<td>0</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Information Visualisation</td>
<td>22</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Vienna University of Technology</td>
<td>Informationsvisualisierung</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Masaryk University of Brno</td>
<td>Informatics Colloquium</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multimedia data indexing</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Germany</td>
<td>Max-Planck-Institut für Informatik</td>
<td>Information Retrieval and Data Mining WS 2005/06</td>
<td>18</td>
<td>0</td>
<td>0</td>
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<tr>
<td></td>
<td></td>
<td>Information Retrieval and Data Mining WS 2002/2003</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Universität Duisburg-Essen</td>
<td>Information Retrieval</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
## Example

**Top 20 recommended books/textbooks list (selected)**

<table>
<thead>
<tr>
<th>Count</th>
<th>Topic</th>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Information Retrieval</td>
<td>Modern Information Retrieval</td>
<td>Ricardo Baeza-Yates, Berthier Ribeiro-Neto</td>
</tr>
<tr>
<td>5</td>
<td>Information Retrieval</td>
<td>Information Retrieval</td>
<td>van Rijsbergen C.J.</td>
</tr>
<tr>
<td>3</td>
<td>Information Retrieval</td>
<td>HySpirit - Integrating Information Retrieval and Database Technologies</td>
<td>Roelleke T., Lalmas M. and Luebeck R.</td>
</tr>
<tr>
<td>3</td>
<td>Information Retrieval</td>
<td>Introduction to modern information retrieval.</td>
<td>Chowdhury, G. G.</td>
</tr>
<tr>
<td>2</td>
<td>Classification</td>
<td>Pattern Classification</td>
<td>Richard O. Duda, Peter E. Hart, David G. Stork</td>
</tr>
<tr>
<td>2</td>
<td>Language Processing</td>
<td>Foundations of Statistical Natural Language Processing</td>
<td>Christopher D. Manning, Hinrich Schütze</td>
</tr>
</tbody>
</table>
Example

Reference paper list (selected)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database</td>
<td>Maintenance of Materialized Views: Problems, Techniques, and Applications</td>
<td>Ashish Gupta et al.</td>
</tr>
<tr>
<td>Digital Library</td>
<td>A Spectrum of Interoperability. The Site for Science Prototype for the NSDL.</td>
<td>William Y. Arms et al.</td>
</tr>
<tr>
<td>Digital Library</td>
<td>Automated Digital Libraries. How Effectively can Computers be used for the Skilled Tasks of Professional Librarianship?</td>
<td>William Y. Arms</td>
</tr>
<tr>
<td>Digital Library</td>
<td>Digital Libraries, value, and productivity.</td>
<td>Wiederhold, G.</td>
</tr>
</tbody>
</table>
## Example

### Online documents list (selected)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Title</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Visual knowledge builder</td>
<td><a href="http://www.csd.tamu.edu/VEK/vek_download.html">http://www.csd.tamu.edu/VEK/vek_download.html</a></td>
</tr>
<tr>
<td>Data access object</td>
<td>J2EE Patterns: Data Access Object</td>
<td><a href="http://java.sun.com/blueprints/corej2eepatterns/Patterns/DataAccessObject.html">http://java.sun.com/blueprints/corej2eepatterns/Patterns/DataAccessObject.html</a></td>
</tr>
<tr>
<td>Database</td>
<td>Agile Database Techniques</td>
<td><a href="http://www.ambysoft.com/agile/DatabaseTechniques.html">http://www.ambysoft.com/agile/DatabaseTechniques.html</a></td>
</tr>
<tr>
<td></td>
<td>Datenbanken Artikel</td>
<td><a href="http://www.onjava.com/topics/java/jdbc_sqlj">http://www.onjava.com/topics/java/jdbc_sqlj</a></td>
</tr>
<tr>
<td></td>
<td>Hibernate Your Data</td>
<td><a href="http://www.onjava.com/pub/a/onjava/2004/01/14/hibernate.html">http://www.onjava.com/pub/a/onjava/2004/01/14/hibernate.html</a></td>
</tr>
<tr>
<td>html</td>
<td>A List Apart</td>
<td><a href="http://www.alistapart.com/">http://www.alistapart.com/</a></td>
</tr>
</tbody>
</table>
Links to Resources

Excel files can be downloaded from the links below.

- Corpus Table Download Link
  http://curric.dlib.vt.edu/DLcurric/syllabiCollection/European/v1/EuropeanDLCourseCorpusTable-v1.xls

- Textbook Analysis Table Download Link
  http://curric.dlib.vt.edu/DLcurric/syllabiCollection/European/v1/EuropeanDLCourseBookAnalysisTable-v1.xls

- Reference Paper Analysis Table Download Link
  http://curric.dlib.vt.edu/DLcurric/syllabiCollection/European/v1/EuropeanDLCoursePaperAnalysisTable-v1.xls

- Online Documents and Tutorials Analysis Table Download Link
  http://curric.dlib.vt.edu/DLcurric/syllabiCollection/European/v1/EuropeanDLCourseOnlineDocTutorialsAnalysisTable-v1.xls
• Taxonomy Development:

- By examining the syllabi and current DL courses, we developed a Taxonomy of DL Educational Resources
Textbook on DLs

- PI Fox, along with co-author Gonçalves, is preparing a textbook on DLs based on 5S
- This work will rely on the 5S framework to ensure that it provides integrated coverage of the many concepts related to DLs
- Fox and Gonçalves are focused on a book for teaching as well as reference
Textbook Outline

• Ch. 1. Introduction (Motivation, Synopsis)

• Part 1 – The “Ss”
  – Ch. 2: Streams
  – Ch. 3: Structures
  – Ch. 4: Spaces
  – Ch. 5: Scenarios
  – Ch. 6: Societies
Textbook Outline

• Part 2 – Higher DL Constructs
  – Ch. 7: Collections
  – Ch. 8: Catalogs
  – Ch. 9: Repositories and Archives
  – Ch. 10: Services
  – Ch. 11: Systems
  – Ch. 12: Case Studies
Textbook Outline

• Part 3 – Advanced Topics
  – Ch. 13: Quality
  – Ch. 14: Integration
  – Ch. 15: How to build a digital library
  – Ch. 16: Research Challenges, Future Perspectives

• Appendix
  – A: Mathematical preliminaries
  – B: Formal Definitions: Ss
  – C: Formal Definitions: DL terms, Minimal DL
  – D: Formal Definitions: Archeological DL
  – E: Glossary of terms, mappings
What we do:

- Identify, develop and test educational DL modules, guided by
  - Experts and international collaborators
  - Computing Curriculum 2001 [6,7]
  - 5S framework [1,2,3,4]
    (Ex) Module revision in 3/27/06
  - Analysis of DL course syllabi
    (Ex) UNC-CH is collecting DL syllabi
    VT collected syllabi from DELOS member institutions in Europe
  - Development of module template
Module Template

- Module Design is based on the resources below and the UNC’s module template


Module Template

• VT Template + UNC Template - June 2, 2006 (draft)

1. Module name
2. Learning objectives
3. Level of effort required (in-class and out-of-class time required for students)
4. Prerequisite knowledge required (completion optional)
Module Template

5. Relationships with other modules
6. 5S characteristics of the module
7. Introductory remedial instruction
   (completion optional: intended to address the prerequisite knowledge/skills required)
8. Resources (textbooks, required and optional readings for instructors and students)
   → Plan A: this section includes resources of all topics in a module
Module Template

9. Body of knowledge (Theory + Practice)
Topics might be skipped or studied in different orders

**Topic 1**
- Theories and background knowledge of the topic
- Learning activities
  - Presentation slides
  - Interactive demo
- Resources
  - Textbooks (relevant parts might be marked with SI tool)
  - Reference papers (relevant parts might be marked with SI tool)
  - Advanced reading
  - Worksheets

**Topic 2**

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**Topic 3**
Module Template

10. Concept map (created by students)
11. Exercises / Learning activities
12. Evaluation of learning outcomes
13. Glossary
14. Useful links
Module Template Example
-Multimedia Module-
Summary

- Identify, develop and test educational DL modules, guided by
  - Experts and international collaborators
  - Computing Curriculum 2001
  - 5S framework
    - (Ex) Module revision in 3/27/06
  - Analysis of DL course syllabi
    - (Ex) UNC-CH is collecting DL syllabi
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Conclusions

• We hope that this project, DL curriculum development, would help achieving NDLTD goals beneficial to students, universities and the world.

NDLTD Goals:
• For Students:
  – Gain knowledge and skills for the Information Age
  – Richer communication (digital information, multimedia, …)
• For Universities:
  – Easy way to enter the digital library field and benefit thereby
• For the World:
  – Global digital library – large, useful, many services


References


Thank you!
Extras