Towards a National SMETE Digital Library at www.smete.org

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Outline

• What is a “digital library” for education?
• What is a National SMETE Digital Library?
• NEEDS—The National Engineering Education Delivery System
• Towards a National SMETE Digital Library

Copies of this presentation will be available at:
http://www.learnativity.com/ and
http://www.smete.org/smete/info/presentations/
What is a “digital library” for education?

• **DOES** focus on teaching and learning
• **NOT** just an academic research library in digital form

• **IS** a *Digital Learning Community* that allows…
  “. . . community members, both novices and experts in technology enhanced learning, [to] work together to improve science, mathematics, engineering and technology education in their classrooms, in their coursework, across disciplines and with each other.”
What is a National SMETE Digital Library?

• New NSF program, 2000–2005+?

Vision . . .

“... a network of learning environments and resources for Science, Mathematics, Engineering and Technology education, [that will] . . . meet the needs of students and teachers at all levels—K-12, undergraduate, graduate, and lifelong learning—in both individual and collaborative settings.”

— National Science Foundation
NEEDS—The National Engineering Education Delivery System
www.needs.org
NEEDS is the foundation for the National SMETE Digital Library at www.smete.org.
How does NEEDS help users “re-use” learning materials?

• Provides mechanisms to help user locate materials
  – Uses standardized descriptions (metadata) to describe resources

• Provides mechanisms to help users evaluate the “quality of materials”

• Developed upon an extendable platform to:
  – Support multiple uses
  – Integrate new services and features
  – Integrate research
The Premier Award for Excellence in Engineering Education Courseware

- A national competition to identify and reward the authors of high-quality, non-commercial courseware designed to enhance engineering education.
  - The Premier Award is about the entire experience of using the courseware by learners, not just the courseware itself

- A dissemination system to distribute the Premier Courseware (via CD’s and presentation at engineering education conferences).
Towards A National Science, Mathematics, Engineering and Technology Education (SME, TE) Digital Library
Needs Assessment with Members of the Math, Science and Engineering Community

Purpose:
To understand the math, science and engineering communities of educators and examine their needs in order to design services and structures to support users from multiple communities.

Research Questions:
• What services, features & programs are integral to success?
• What do users expect with regards to quality of the holdings?
• Who makes up the SMETE digital library community?

American Association of Physics Teachers, American Mathematical Society, American Association for the Advancement of Science, members of the NSF Chemistry Consortia and the NSF Engineering Education Coalitions
Translating Findings into Services & Features

Quality

• System to rapidly identify the quality of holding
• Place to comment about a learning object or regarding something of interest to the community
• Reviewers should include experts in pedagogy and content
Translating Findings into Services & Features

Community
• Embedded structures for developing and maintaining communication links
• Developing community should be on par with building content
• Build on discipline based communities to establish connection to a broader community

Content
• Useful content and community interaction ensures user participation as authors, reviewers, adapters/adopters, and consumers
NSDL Goals (2000–?)

- Develop the National SMETE Digital Library
  - Provide seamless access to services and resources
  - Create a dynamic learning community that promotes and supports SMET education in the 21st century

- Expand Partnerships
- Expand Services and Community
Building a National SMETE Digital Library at www.smete.org

- Searching for learning resources
- Cataloging (adding) learning resources
  - IEEE LOM Standard and IMS Specifications
- Evaluating the quality of learning resources
  - “User” reviews
  - “Expert” reviews
- Forming a community of users in SMETE
  - PKAL workshops and seminars
  - Research on adapters
Systems Development across Partners

• **Expanding www.smete.org/NEEDS platform**
  – Adopting emerging IEEE standards, participate in their development
  – Expanding user comments
  – Implementing discussion systems
  – Implementing customized user profiles

• **Expanding Collections**
  – Expanding into Chemistry, Physics, and Mathematics

<table>
<thead>
<tr>
<th>Total Collection</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>58%</td>
</tr>
<tr>
<td>Chemistry</td>
<td>21%</td>
</tr>
<tr>
<td>Physics</td>
<td>14%</td>
</tr>
<tr>
<td>Math</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
</tr>
</tbody>
</table>
Collaborating with Partners

- Working with Eisenhower National Clearinghouse and Math Forum
  - Identify common metadata
  - Exchange records for common searching
  - Working together as part of the American Mathematics Metadata Task Force

www.mathforum.com   www.enc.org
Challenges Toward the Future...

• Continuing to understand and support changing user needs

Improving ability to encapsulate the instructional intent and use of materials

– Metadata standards and cataloging practice

Supporting communities of use and practice

– pedagogy

– content
Demo

See www.smete.org
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Premier Courseware of 1997-1999

- Virtual Disk Drive Design Studio
- Drill Dissection and Bicycle Dissection
- Mars Navigator

- Della Steam Plant
- MDSolids
- Structural Engineering Visual Encyclopedia - UNH

- Engineering Graphics
- Cracking Dams

6,700 CD-ROMs Distributed

For more info or to receive copies go to http://www.needs.org/engineering/premier/