TOWARDS A DIGITAL LEARNING COMMUNITY FOR ENGINEERING EDUCATION

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Abstract *– NEEDS has developed a scalable infrastructure that allows engineering educators to locate and discuss digital learning resource and participate as part of a community of practice. NEEDS is now in the process of expanding to include a broader community of learners and educators in Science, Mathematics, Engineering and Technology Education (SMETE).*

The emergence of the Internet and World Wide Web as a viable means for national and international sharing and re-use of education materials fundamentally changed our view of the way education and learning can be delivered. We are seeing an enormous quantity of materials being developed to support teaching and learning in this new era. However locating these resources and evaluating their quality can be quite difficult.

Two key National Science Foundation (NSF) reports, "Systemic Engineering Education Reform: An Action Agenda" and "Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics, Engineering, and Technology," urge the formation of a national resource to provide access to quality learning objects and to disseminate successful educational practices. This national resource is envisioned as something that is much more than a traditional academic library in digital form, it will be a *digital learning community* where learners and instructors can come together to locate and discuss teaching and learning. It will provide ready access to a wide range of resources to enhance learning and it will help users identify quality materials from the vast variety of materials currently available on the Internet and World Wide Web.

This presentation will present lessons learned from the decade of experience NEEDS—The National Engineering Education Delivery System, has in developing and running a digital library for engineering education. We will demonstrate and discuss current features and services. We will articulate how our experiences with NEEDS are driving the development of a broader national program to develop the National Science, Mathematics, Engineering and Technology Education (SMETE) Digital Library.

Multidisciplinary Partnerships: Our background in engineering education (through NEEDS and the Synthesis Coalition) has shown the value in developing multi-disciplinary teams and strong partnerships among diverse organizations. We are leading the development of an alliance that will demonstrate a federation of collection and service providers in a National SMETE Digital Library at www.smete.org. Ultimately a wide variety of partners will be necessary; some will provide access to collections while others will provide services or the core infrastructure about which the federation is developed.

Standards and Protocols for Resource Description and Interoperability: Building upon our experience with NEEDS, we know that standards and protocols are the glue that will allow us to build a seamless National SMETE Digital Library at www.needs.org. Standards provide mechanisms for sharing metadata about resources, and protocols provide the means to accomplish interoperability between systems.

Community of Learners: If standards and protocols are the glue that holds the technical infrastructure in place, then community provides the threads to weave content and pedagogy into learning and teaching. We know that for any effort to be successful, the resources we develop for a national digital library for SMETE, must be built around and support a community of use and practice. Thus the digital learning community of the National SMETE Digital Library at www.smete.org, to reflect some of the best qualities of real life communities, should be persistently interactive, mutually supportive, and provide its members with mechanisms to adapt and build on the work of others to strengthen SMET educational programs.

The frenetic pace of change in information technologies has exacerbated the age-old problem of finding information. With everyone a "publisher" in this new information age, the volume of materials is drastically increasing. Even if we "just" limit ourselves to engineering education, the volume is enormous. NEEDS and alliance partners are developing a new vision, a *digital learning community* that extends beyond a single discipline. We are working to develop a National SMETE Digital Library at www.smete.org; encompassing a federation of collection and service providers to support the learning and teaching needs of a broad community of learners in the sciences, mathematics, engineering and technology education.

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