About STEM Exchange

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A growing corpus of digital learning resources for science, technology, engineering, and mathematics (STEM) education is emerging from the investments of private foundations and federal agencies including NSF, NASA, NOAA, and others. In response, programs such as the National Science Digital Library (NSDL) have been created to provide vital services for the grantees in universities, professional societies, museums, research labs, and educational non-profits who are developing digital content, including: organizing online access to the materials, monitoring their relevance to the needs of classrooms, and reporting best practices among the community of resource providers. As teachers become increasingly comfortable with integrating digital content into both traditional and innovative pedagogies, the use of online resources is increasing. Yet there is much we do not yet know about their impact. The continual improvement of what NSF terms cyberlearning resources, and our understanding of their efficacy, could be significantly enhanced by better communication between educational communities of practice about what works in real-world learning environments, and better feedback loops between educational end users and educational resource developers.

Initiated with the cooperation of the White House Office of Science and Technology Policy, The STEM Exchange is a new strategy envisioned by the National STEM Digital Library (NSDL) in response to the educational transformations made possible by an increasingly networked world. The vision of the STEM Exchange calls for a new information system around digital resources that can automatically capture and display aggregated real-time user interaction data as resources are annotated, reviewed, downloaded, embedded, shared, accreted, modified, and updated by user-practitioners through their professional online communities, social media spaces, and state and districts resource portals. The STEM Exchange is being built by NSDL, in collaboration with a range of STEM education partners, as an open source web service designed to:

1) speed the diffusion of digital content to educational practitioners through a wider range of online dissemination channels and mobile devices,
2) promote the alignment of digital learning content to academic achievement standards including the emerging Common Core Standards,
3) empower existing teacher communities to mobilize contextualized materials directly in their own online platforms,
4) enable broad user feedback data to enhance understanding about the adoption and impact of cyberlearning resources in diverse teaching and learning environments.

Through the Exchange, online communities of educational practitioners will be able to integrate customizable datastreams about resources from NSDL and other providers directly into their user platforms. The social media activities of practitioner communities will generate data about how resources are being used in different contexts that the STEM Exchange will assemble into resource profiles incorporating both handcrafted and automatically captured information. The resulting paradata describing resource use will be fed back into resource profiles to assist users in discovering and utilizing educational materials and to enhance resource providers' understanding of how their materials are being disseminated, used, and contextualized by practitioners.

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