Fostering Learning in the Networked World

Executive Summary

Imagine a high school student in the year 2015. She has grown up in a world where learning is as accessible through technologies as it is through books. At school, she and her classmates engage in creative problem-solving activities by manipulating simulations in a virtual laboratory or by downloading and analyzing visualizations of real-time data from remote sensors. Away from the classroom, she has seamless access to school materials and homework assignments using inexpensive mobile technologies. She continues to collaborate with her classmates in virtual environments that allow not only social interaction with each other but also rich connections with a wealth of supplementary content.

Her teacher can track her progress over the course of a lesson plan and compare her performance and aptitudes across a lifetime “digital portfolio” of making note of areas that need additional attention through personalized assignments and alerting parents to specific concerns. What makes this possible is cyberlearning, the use of networked computing and communications technologies to support learning. Cyberlearning has the potential experiences over time and space, beyond their initial development cycle.

We also identify seven special opportunities for action that we feel have the greatest short-term payoff and long-term promise among the many that NSF might pursue. These opportunities tap into the potential of technologies to coordinate learning across multiple contexts, to connect students with remote and virtual laboratories, and to access virtual or “mixed reality” environments for interactive change.

The use of cyberlearning technologies also introduces specific issues that require prompt action. For example, NSF policies can play a role in guaranteeing that open educational resources are truly open and available for future use. The potential convergence of cyberlearning with other key concerns. Students and teachers alike need to be taught how to manage large amounts of data and to do so through scientific research or collected as part of a student’s educational history.

Perhaps most importantly the NSF director, along with other key stakeholders, need to recognize cyberizing as a pervasive NSF-wide strategy by funding the development of resources that can be used for both research and education.

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