5. Recommendations:

NSF NSDL and ITEST Programs

5.1 Cyberlearning and the Evolving National STEM Digital Library (NSDL)

The National STEM Digital Library has explored some of the issues relevant to cyberlearning. NSDL is a large-scale project based on a vision that is now eight years old. An NSF review of the NSDL program is appropriate and timely, and we urge NSF to empanel such a review, with a charge that includes consideration of the future of NSDL in the context of recent developments in cyberinfrastructure and cyberlearning broadly.

NSDL offers evidence for two aspects of cyberlearning. Projects have explored searching and selection of materials from large numbers of collections of learning objects to meet the needs of educators and learners. NSDL is now in competition with commercial services such as Google that are much more comprehensive in the genres of material that they cover. Although these competing services cover learning objects specifically in less depth, the question of cost-benefit of the specialized NSDL portal needs periodic revisiting.

NSDL projects have also investigated the tools and human relationships needed to make the objects in the library useful. Effective ways to support users of materials developed by others remains an open question, especially given the complexities of the educational system. In thinking about the future of NSDL and the ways in which the NSDL investments can contribute to future cyberlearning programs, it is important to recognize that NSDL is not simply an information technology system; it has, for example, invested in developing a powerful human and organizational network to address challenges such as curricular linkage for learning materials.

Please see appendix 2 for further information about NSDL.

The NSDL program should be reviewed in the context of new developments in NSF cyberinfrastructure and cyberlearning initiatives and in light of the changing technological, social, and economic environments identified in this report.

5.2 Cyberlearning and the Evolving ITEST Program

The Innovative Technology Experiences for Students and Teachers (ITEST) program funds projects that explore issues in cyberlearning. The ITEST program is designed to increase student interest and proficiency in information technology and to guide more students into advanced study and careers. The program responds to current concerns and projections about shortages of STEM professionals and information technology workers in the United States and seeks solutions to help ensure the breadth and depth of the STEM workforce. ITEST supports the development, implementation, testing, and scale-up of models, as well as research studies to address these questions and to find solutions. There are a variety of possible approaches to improving the STEM workforce and to building students' capacity to participate in it.

An NSF review of the ITEST program is appropriate and timely, and we urge NSF to empanel such a review, with a charge that includes consideration of the future of ITEST in the context of recent developments in cyberinfrastructure and cyber-learning.

A 21st Century Agenda for the National Science Foundation