

Judy,

Many thanks for taking time from your busy schedule to have lunch last week and update me on the activities of the Education and Human Resources Directorate. Clearly there are many challenges and opportunities facing the Directorate, and you can count on me for active participation both on ACEHR as well as other supporting tasks.

Our conversation triggered some further thoughts on the flight back to Ann Arbor, and I thought I would send them along via e-mail. I begin with three premises:

Premise 1: We have entered an age of knowledge, in which educated people and their ideas have become the keys to social prosperity, security, and well-being. Furthermore, in such an age, education has become the key determinant of one's personal prosperity and quality of life.

Premise 2: It has become the responsibility of democratic societies to provide their citizens with the education and training they need, throughout their lives, whenever, wherever, and however they desire it, at high quality and at an affordable cost; that is, to create a society of learning in which life-long educational opportunities become not only available to but pervasive in the lives of all of our citizens.

Premise 3: The National Science Foundation is the logical federal agency for providing national leadership in creating this "society of learning" for several reasons: 1) much of the knowledge most critical to our future will be based upon science, mathematics, and technology; 2) NSF is unique among federal agencies in having both a charter and experience in the conduct of fundamental research concerning education at all levels; 3) NSF is also unique in its ability to engage the entire research community in high-quality, merit-driven research directed at national priorities such as education. In fact, much of the innovation in life-long learning will be based upon research and development sponsored by NSF in fields such as information technology and collaboration technology.

However, NSF faces some rather significant challenges in providing such leadership:

1. The ongoing debate over the priority given the role of human resource development (e.g., should the priority ranking be *people > ideas > tools* as suggested by the premises above, or *ideas and tools > people* as proposed by many in the scientific community).
2. The chimney disciplinary structure that still dominates NSF strategy and program development (not to mention funding patterns).

3. The firewalls that exist between various levels of educational programs, e.g., K-12, undergraduate, graduate, and faculty development, workplace training, and lifelong learning.
4. The difficulty in stimulating and supporting truly “out-of-the-box” thinking, unconstrained by traditional scholarly disciplines or existing educational structures.
5. The very real constraints imposed by those in the Administration and Congress who have difficulty accepting a more revolutionary educational role for the National Science Foundation (or for any other federal agency, for that matter).

These are challenging issues, to be sure. But as just as the “space race” of the 1960s drove major investments in research and education, there are early signs that the “skills race” of the 21st Century may soon be recognized as a dominant domestic policy issue, thereby providing an opportunity to break free of existing constraints.

To this end, I thought I would plant several seeds of thought:

1. First, it is important that the National Science Foundation continue to stress the leadership it can provide in education at all levels and, in effect, across most disciplines. No other federal agency has the NSF’s combination of mandate, experience, and reputation for quality in this arena.
2. As I mentioned in our conversation, there is ongoing discussion among a number of leaders of higher education concerning whether it may be time to rethink the social contract between the universities and society. As background on this discussion, I am attaching a brief white paper I developed for NASULGC and AAU concerning the possibility of a federal act similar to the Land-Grant Acts of the 19th Century, except in this case I call it a “Learn-Grant Act for the 21st Century”.
3. It may be time to augment the traditional investigator-initiated NSF model with the strong strategic character of the DARPA model. I have included a copy of a letter I send to Neal Lane a couple of years ago proposing the establishment of an “Education Advanced Research Projects Agency” within the Department of Education, funded at a very substantial level, but directed at least for the near term by the basic research agencies, NSF and NIH, because of the limited capability of DoEd in managing high-quality, merit-determined scientific research.
4. I believe you folks need to establish either within the Directorate or NSF more broadly an “out-of-the-box” research operation analogous to the Lockheed Skunkworks. Particularly in the field of education, you really need to stimulate more people to set aside the traditional education systems and constraints and think far broadly and boldly about just what

knowledge and skills citizens will need in a global knowledge-driven society, and then how to build learning resources that will address these needs throughout their lives.

On this last issue, let me mention a project that Dan Atkins of Michigan, John Seely Brown of Xerox PARC, and I have been thinking about launching for the year ahead. It is our intent to bring together a brainstorming group of scholars from various fields and institutions (both on campus and via the Internet), along with a number of graduate students, to see what might be involved in developing from a clean slate, without the constraints of disciplines, educational practice or politics, a learning "architecture" or "ecology" appropriate for an age of knowledge. I'm not quite sure what will come out of this year-long exercise, but we might generate some operational ideas for NSF. If this would be of interest to you, we could certainly use some modest funding for planning (primarily the support of a couple of graduate students and some travel expenses for participants). I've attached a brief description of the effort.

Feel free to share any of this material with colleagues. I will keep you up to speed on some of our other ongoing activities such as the National Academy of Sciences project concerning the impact of information technology on the future of the research university.

Good to see you again. Look forward to working with you on ACEHR in the months ahead.

Jim