

Project Report to the Atlantic Philanthropies

Education in the Digital Age: Leadership, Linkages, and Roadmaps

Application Number 9193

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April 2004

Executive Summary

During the past six months we have continued our efforts to build and work with leadership linkage groups at the university, state, national, and international levels. Examples of those groups include: an organization of liberal arts colleges in Michigan; a University of Michigan led group exploring open source strategies; higher education coordinating groups such as AAU and NASULGC; and the Glion Colloquium of university leaders in Europe and the United States.

We are now involved in the final phase of the project: the roadmapping effort. As reported previously, we have decided to employ the technology roadmapping process developed in the electronics industry and used successfully by major federal agencies such as DOE and NASA. The specific goal of this planning and evaluation process is to develop a roadmap that identifies and addresses both the life-long educational needs of citizens as well as the workforce skills necessary for a region to flourish in a global economy using emerging information and communications technology. We intend to have the roadmap completed in the fall 2004.

In addition to reporting on the status of objectives, we are now at a point in the lifecycle of the project to be able to reflect on lessons learned. The *21st Century Educational Needs* project was designed to have an iterative assessment process – building from internal or self-evaluation to a more formalized external review of our efforts. This ongoing internal evaluation by the project's key advisors has led us to some preliminary estimation of what has both been effective as well as ineffective in forming linkage groups. Issues of organizational capacity, sustainability, and institutional self-interest are questions that have arisen. An initial discussion of those lessons learned are detailed in the narrative and will also be used as guiding questions in the external review.

Narrative

Under this grant funded by the Atlantic Philanthropic Service Company (APS), the Millennium Project has undertaken a multi-year, multi-layered project focusing on the manner in which information technology reshapes the boundaries in higher education – among institutions, disciplines and education levels.

The *21st Century Educational Needs* project concerns the broad role of information and communication technology in determining higher education's ability to serve the changing educational needs of a knowledge-driven society. The project is aimed at understanding and influencing the impact of information technology on higher education by: 1) establishing and guiding several key leadership linkage groups aimed at identifying issues and developing action agendas; 2) building knowledge resources to support these linkage groups; and 3) using these leadership groups and knowledge resources to develop a series of strategic roadmaps for various constituencies of higher education (e.g., colleges and universities, national organizations, and stakeholders such as state and federal government).

The first two years of the project have been aimed at building the necessary knowledge networks, developing various materials to support these conversations, and communicating the results of the project to other constituencies at the national and international level. The third stage of the project, a roadmapping process for higher education, has now also been undertaken.

Progress has been made in all three areas of the project: (1) Leadership Linkages; (2) Knowledge Resources; and (3) Roadmapping.

Leadership Linkage Groups

There has been significant activity within leadership linkage groups at the university, state, national and international levels.

- **Statewide College and University Networks:** During the past six months we have continued our interactions with the presidents of Michigan's liberal arts colleges, the Michigan Colleges Foundation (MCF). In the early stages of the project we built a network among the presidents of Michigan's independent colleges. That network has continued to

evolve and a variety of initiatives have resulted. First, based on the work of a sub-group of MCF provosts, a senior seminar between the independent colleges and the University of Michigan has been developed and will be piloted by January 2005. A variant of the traditional semester abroad program, students at Michigan independent schools will be able to enroll at the University of Michigan's School of Information (SI) for the first semester of their senior year and take one SI graduate foundation course and one or more other courses through distance learning technology while exploring the possibility of "virtual" 3/2 programs. The provosts' collaboration has also yielded the development of a shared course on information. Second, discussions are taking place with library directors to explore the use of technology to share resources, with a particular focus on electronic media. Currently, there are two such projects underway – a project to digitize a collection of American Indian artifacts, slides and film; and the inclusion of independent college librarians into the University of Michigan's summer Instructor College. Finally, discussions are continuing on the creation of a shared resource base among the independent colleges. Because this effort will require significant strategic and technical support to allow for authenticated sharing of institutional resources and courses, we are arranging meetings with the MCF presidents and representatives from Internet2 in summer.

Within the University of Michigan, we have worked closely with the provost and the chief financial officer to stimulate a major series of workshops to explore future technology strategies both for Michigan and for higher education more generally. Specifically, the university has formed the Digital Strategy Council which is focusing on the implications of digital technology for communication, collaboration, and communities, with the first major outcome being a new consortium involving Michigan, MIT, Indiana, Stanford, and uPortal in building a new open source technology platform for higher education. This process has also enabled the university to draw together the various perspectives and needs of diverse academic and professional disciplines.

- **National Higher Education Linkages:** Efforts aimed at engaging the leadership of national higher education associations are continuing with ongoing interactions with the leadership of key groups such as ACE, AAU, NASULGC, AAHE, and other "One Dupont Circle"

organizations. Here, we have focused on conducting workshops for a number of provost groups. In September, through the NAS IT-Forum, we conducted a day-long workshop for AAU provosts at the Beckman Center in Newport Beach. In early November we held a similar workshop for NASULGC chief academic officers. Later in November we conducted a videoconference workshop for Canadian provosts. And, as mentioned previously, we have had ongoing linkages with the Michigan independent colleges provost subgroup. In our view, working directly with the provosts may be the most effective route to affect college and university academic programs, since provosts, as the chief academic officer (and frequently also the chief budget officer) at an institution, are primarily responsible for decisions that affect IT acquisition and implementation.

- **Federal Linkages:** We continue to work closely with the National Science Foundation to engage in conversations about cyberinfrastructure, information technology, and the future of higher education institutions. In October, we were invited to conduct a day-long workshop for NSF leadership concerning the impact of information technology on learning and the challenges and opportunities for NSF to provide leadership and stimulate change in our nation's learning enterprise. In addition to our contacts with NSF, we have had discussions on IT and cyberinfrastructure with John Marberger, Presidential Science Advisor.
- **International Linkages:** Throughout the course of the project we have realized that the issues of life-long educational needs and workforce development extend beyond national boundaries. In July 2003, I co-chaired the Glion Colloquium, a major workshop in Switzerland consisting of university leaders from North America and Europe. The purpose of the workshop was to enable leaders to discuss major challenges facing research universities, in which technology issues played a major role. The meeting resulted in the publication of a book I co-edited, *Reinventing the Research University*. We will continue to have a connection to the Glion Colloquium as I have been asked to co-chair the Glion 5 conference, scheduled to occur in the summer 2005.

We have continued to work with Canadian universities, conducting a two-hour videoconference with provosts of the major Canadian research universities regarding

information technology and the future of the university. We have also had discussions with the leadership of universities in Japan, Korea, Poland and Australia. Finally, working closely with Daniel Atkins, we are exploring the implications of our work along with that of the NSF Cyberinfrastructure study for forming global higher education collaboratives. The first meeting of international higher education leaders was held in Ann Arbor in April.

Supporting the Knowledge Environment

March saw the release of a publication I co-edited with Luc Weber, *Reinventing the Research University*. The book was a direct outgrowth of the Glion conference. Articles in the book address a number of issues, including: transformations in teaching and research; the evolving relationship between research universities and their communities; and the challenges of financing and governance. (Copies of the book are being provided.) In addition, during the past six months I have been involved in numerous presentations and workshops based on our project both at a number of universities, major national meetings and at federal agencies. For your reference, a listing of those major meetings, workshops and addresses is attached.

Strategic Roadmapping Process

The final phase of this project, the development of a regional plan to address the challenges and opportunities to higher education provided by digital technology, is well underway. The process we have chosen to employ is that of *technology roadmapping*, a familiar tool from the electronics industry and major federal science agencies. This process has four steps: 1) a needs assessment; 2) a mapping of existing resources; 3) an identification and analysis of resource gaps; and 4) the development of a roadmap to eliminate the gaps and address the needs. Although this planning effort was originally intended to focus on the state of Michigan as a specific case, the process we are developing could be propagated to other states and regional areas.

The focus of our technology roadmapping effort is to develop a roadmap for building a regional learning ecology based on digital technology, that is, a learning environment (primarily concerned with higher education but linked to other elements of the learning enterprise) that is

both adaptive and evolutionary in nature. We have launched a process to develop a plan for a learning infrastructure for a regional area that meets both the life-long educational needs of citizens and the workforce skills necessary in a global knowledge-driven economy.

The key to roadmapping is to make extensive use of a wide array of inputs from experts in various areas related to the project. As such, we have undertaken the needs assessment and resource mapping by convening a core group of advisors. In addition to the key advisor group, we have invited experts into our meetings to discuss higher education and public policy. Discussions have included how technology effects learning, the charter school movement, and trends in state demographics and their effects on educational needs in the community. The resource mapping effort currently underway is assessing conventional resources such as K-12 educational systems, colleges and universities, and workplace training but also informal learning through libraries, museums, and other cultural resources and community organizations such as 4-H, scouting, and extracurricular activities.

We will continue to use the key advisory group to conduct the gap analysis, which is aimed at identifying missing resources necessary to achieve the vision for a 21st century education, including the need for new types of institutions, providers, resources (e.g., “teachers”), policies, investments, and, perhaps most important, a new culture of learning.

The final phase, undertaken over the summer and fall, will involve the development of the roadmap to build a learning infrastructure (heavily technology dependent) capable of responding to the identified needs. This will include suggested policies and investments. We see this roadmap effort as targeted at key leaders of the public and private sectors, including the governor, the leaders of existing educational institutions and organizations, the heads of nonprofit foundations, and the leaders of business and industry in the region.

Evaluation & Lessons Learned

We now feel that we are at a point in the lifecycle of the project to be able to reflect on lessons learned. We designed the project to employ an iterative assessment process – building from internal or self-evaluation to a more formalized external review of our efforts. Throughout the

life of the project we have interacted with our key advisory or guidance committee. This group has provided an ongoing internal evaluation, leading us to some preliminary estimation of what has both been effective as well as ineffective in forming linkage groups.

Issues of organizational capacity, sustainability, and institutional self-interest are questions that have arisen in the creation of linkage groups. We have found that it has been relatively easy to stimulate strong interest in the formation of collaborations, but the real challenge is sustainability. We were able to foster bringing together leaders, especially in our independent college demonstration. However, the real challenge involved adapting existing or building new organizational structures capable of sustaining the collaboration. In the case of the Michigan independent colleges, as an example, it was through our efforts that provosts at independent colleges in Michigan met together for the first time as a single group. Though encouraging, it also points to a need for capacity building – not just linkage building – among the institutions. A structure issue also thwarted our efforts to work with Michigan foundations. Here, the small Michigan private and community foundations simply didn't have internal structures through which they could collaborate. In both cases, based on our internal assessment, we have found it more effective to work primarily with the large national and international groups (e.g. NSF, AAU, Glion) and foundations (e.g. Kellogg, Mott).

Another lesson learned had to do with institutional affinity. After some preliminary work, we concluded that the diversity of regional public institutions makes a state-based regional collaborative awkward. Hence we limited our interactions to selected institutions aimed primarily at providing input for our technology roadmapping effort. In a similar spirit we are interacting with the leadership of Michigan's community college organization rather than building a separate collaborative.

We believe these questions and lessons learned will help guide part of the external evaluation of our project and our process. In order to do this broad assessment, we plan to convene a major workshop in the fall at the University of Michigan. We will invite both external evaluators who are recognized for their work in this field as well as university presidents and state government leaders who will be capable of assessing the regional effort.

Summary

In summary, we have made good progress in all elements of the project: building leadership networks, developing the supporting knowledge resources and communications efforts and technology roadmapping. We look forward to the completion of the roadmap this summer, concluding with a major workshop in the fall where the external evaluation of our efforts will occur.

Appendix: Major Meetings, Workshops and Addresses on IT and Higher Education

During Grant Period June 1, 2003 and April 1, 2004

June 23, The Glion Colloquium, Montreaux, Switzerland
“The Changing Nature of Research and Scholarship”

July 22, Society of University and College Planners, Keynote Address
Navigating the University through the Stormy Seas of a Changing World

July 31, Calvin College, meeting of Midwest Colleges
Learning in the Digital Age

September 4, Carnegie Mellon University, IT Forum
The Plug and Play Generation

September 9, AAU Provost’s Workshop, Newport Beach, CA
IT and the Future of the Research University

October 1, Texas A&M University, Academic Convocation, College Station, TX
The Future of the Research University

October 7, University Consortium on Atmospheric Research, Boulder, CO
Future Trends in Scientific Research

October 11, University of California, Santa Cruz
Education and the Research University

October 29: National Science Foundation, Washington, DC
Workshop on IT and Education

November 17: NASULGC Annual Meeting, Provosts Workshop, New Orleans
IT and the Future of the University

November 28: Canadian Provosts Conference, Televideo
The Future of the University

December 8: AAHE Seminar, Washington, DC
IT and the Future of Higher Education

January 14: NSF Cyberinfrastructure Workshop
Summary of NAS IT-Forum Studies on Cyberinfrastructure

February 16: Arizona State Distinguished Lecture Series, Phoenix
IT and the Future of the University

March 12: IT Forum, Center for Creative Studies, Marina del Rey, California
Impact of IT on Entertainment and Gaming Industries

March 17: Discussions on IT and Cyberinfrastructure with John Marberger,
Presidential Science Advisor