TESTIMONY TO THE KERREY COMMISSION ON WEB-BASED EDUCATION

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I. INTRODUCTION

My name is Frank Mayadas; I am a Program Director with the Alfred P. Sloan Foundation. Since late 1992, before there even was a commercial internet, the Foundation has had a program in what is now called online learning, through which we have provided over $35 million in grant support to over 50 institutions of higher learning, members of the Sloan Consortium or Sloan-C. We estimate that approximately 150,000 learners have enrolled for courses offered by Sloan-C institutions, and several hundred have received degrees. Over 170 complete degree and certificate program are offered by Sloan-C members, and can be accessed at the Sloan-C Catalog website (www.sloan-c.org). We estimate that roughly two thirds of the credit courses offered over the internet in this country today are offered by Sloan-C institutions.

We at Sloan believe that online learning represents one of the most important developments of the past hundred years for higher education. We plan to continue our support for this area.

Today, I propose to touch on four points:

- First, I will address just what online education is, since it means different things to different people;

- Secondly, I will take up the question of what kinds of metrics apply to this area;

- Third I will briefly discuss activities underway, or what is really going on;

- And finally, I would like to discuss applicability of online learning to workforce development.

II. WHAT IS ONLINE LEARNING

Online learning today, is of two basic kinds (although there are grades in between): one is a self-study, or "broadcast" model in which materials, maybe quite sophisticated multimedia, but self-study materials nonetheless, are posted on the web, and these are perused and studied by learners at their own pace. This model can also be thought of as a form of online publishing. I remind you that self-study, mainly through books, but more recently augmented by videotapes or broadcast TV, has been available for over a century, and unusually disciplined individuals have been able to learn and earn credentials on their own.

The second model, the "interactive" model is one where "classes" begin on a particular day with a cohort group, are taught by a faculty member who interacts with individuals or the cohort through group e-mail tools, generally referred to as group conferencing software. Interaction with the instructor is not occasional or incidental, rather it is regular and continuous, as is interaction among students. The student/faculty ratio is about the same for these online classes as that for equivalent campus classes. The "class" also ends on a particular day, i.e. the "term" is completed. This interactive model is the basis for most of the grants made by Sloan, because we believe it most closely parallels the learning environments associated with quality learning. Here is why:

For a very long time, quality education has been associated with education on campuses. Campus education has many elements, but there are three that stand out in their importance for education of students:

First, students have access to learning materials. These might include books, classroom handouts such as notes, or special kinds of educational software that may be commercial products or developed and distributed locally by faculty. These learning materials are often used in self-study fashion.

Second, the student has access to a professor. The professor determines overall content for the course and the pace of the course. He/she may add thoughts and insights to what is in the learning materials, and has the task of assessing how well a student has learned.

Campuses offer a third element for learning: other students. Students turn to friends and colleagues for many reasons on many occasions, usually informally to seek help for instance in understanding the particulars of a lecture, or assistance with a problem set.

We at Sloan constructed our program around the idea that these three important elements of campus education…learning materials, the professor and other students…could be provided through the Internet to learners at remote locations. In other words, the kind of quality learning associated with campuses is now possible for everyone and available in a multiplicity of environments…the home, the desktop at work, hotel rooms, and quite likely on airplanes as well. Such learning environments operate 24 hours a day, and 7 days a week, though they generally begin and end on specified days. They allow anytime, anyplace, or "asynchronous" learning.

Successful grant applicants in our program have proposed projects to us that involved an appropriate balance in these three important educational elements, and all have gone on to implement successful projects, many of which today are offering full degrees, and in some cases, multiple degrees. In our projects, as in classroom courses, students are expected to purchase learning materials such as books and CD-ROM's. Notes and other materials are usually available as web postings, and pre-recorded lectures are sometimes made available as streaming media.

Our online learning model envisions the Internet as primarily a communications facilitator, between instructor and students, and students and students, and secondarily as a medium for distribution of learning materials. To emphasize again: nothing is "canned" or pre-recorded in an interactive course other than the self-study learning materials and these of course are about the same as the "canned" materials used in campus education. Interactivity here means interactivity with the instructor and other students and this is all time-elapsed conversations very similar to e-mail exchanges. The online publishing, or broadcast model, primarily envisions the Internet as a distribution medium for learning materials. In the decades to come, both models will see widespread adoption, as will some models that combine aspects of the two. The broadcast and interactive models have different consequences.

The broadcast model generally requires expensive efforts to create learning materials, basically multimedia software, simulations and video. These expenses might be several hundred thousand dollars per course, but there really is no limit, and I am aware of courses costing over a million dollars. The interactive model requires relatively little start-up funding, maybe $10,000 or less to create a typical college course. Typically, we support projects at a level of about $150,000 for a full masters degree, and we require that courses be delivered to learners through very conventional PC's costing under $1000, and very conventional modem connections to the Internet. Because student/faculty ratios approximate those on campus, the interactive model does not lead to a reduction in faculty (in fact, if total enrollments increase because courses are accessible to more learners, the number of faculty needed increases).

III. ASSESSMENTS AND METRICS

The most commonly asked questions about online learning focus on the subject of "quality", i.e. does it work? We are however asking our project to provide a 5-part assessment:

1. ACCESS: To what extent has the interactive model increased access to quality education, beyond what would have been possible through the established method of distributing self-learning materials.

2. LEARNING EFFECTIVENESS*: What has the project learned about how well learning takes place.

3. FACULTY ATTITUDES*: What has the project learned about how easy (difficult) it is for faculty to develop and teach online courses.

4. INSTITUTIONAL MOTIVATION: Is there sufficient motivation for the institution to scale up online education (this may involve financial and other considerations, and earlier in the program, we referred to it as "cost-effectiveness").

5. OVERALL STUDENT SATISFACTION: What has been learned about overall satisfaction of enrolled students (one quantitative measure here is student retention and completion rates).

Recent papers from Sloan-C members on these areas are in volumes 1 and 2 of ON-LINE EDUCATION, John Bourne, Ed., which are available at Amazon.com and at http://www.aln.org/alnbookstore/books_by_aln_authors.htm.

All projects are different in the details of their pedagogical approaches, delivery technology and student services, and so understandably, results tend to vary. In particular, results for a specific course depend greatly on the teaching ability, motivation and experience of the faculty member. We know this is also the case for classroom courses.

Nevertheless, based on our considerable experience, and based on experience with classes that are taught on campus and on the internet by the same instructor giving the same examinations, on balance, we do not find any significant variation in learning effectiveness between classroom and online courses taught in the interactive mode.

Quality of courses and degrees offered today through conventional campus education is not of uniform quality. Similarly, there is no reason to believe that the over 170 degree and certification programs listed on the Sloan-C Catalog are of uniform quality. To be listed in the Catalog, an institution must offer its courses through the interactive model, and must be able to assert that an online program is equivalent in quality to the same or similar one offered on campus.

IV.   THE CURRENT PICTURE

Although much attention goes to new kinds of online learning organizations, consortia, and for-profit education, the fact is that most online learning today is provided by traditional institutions, i.e. community colleges, comprehensive 4-year colleges and some top-tier state universities. In fact, few if any students at all, are currently enrolled in the highly publicized for-profit degree-education providers. An impressive database of information is being accumulated through the real experiences of these institutions. We estimate that for the 99/00 academic year just completed, 300,000 learners enrolled in for-credit courses from these institutions. We expect this number will double for the academic year just starting.

We further estimate that over half these enrollments, perhaps two-thirds, came from member institutions of the Sloan Consortium. Which range from major research institutions such as Stanford, University of Illinois and Penn State, to Community Colleges such as Northern Virginia Community College. By our reckoning, the three largest entities in online education today are the University of Maryland University College, the SUNY Learning Network (SLN) of the State University of New York, and the University of

Phoenix, the only for-profit institution to have any significance in national enrollment numbers for the current period. All these institutions offer courses through the interactive model.

A large number of courses and learning modules, for which I do not have an estimate, are also provided through the broadcast model. These are mainly of the non-credit variety and they are proprietary (within a corporation for example) and many are also available to the public.

V. WORK FORCE LEARNING

We believe online learning has very large significance for our work force. The workforce of tomorrow will have to be better trained, and better able to access education, training and other knowledge resources. The Internet provides the ideal mechanism for this access. Some of the necessary courses, certifications, degrees and other kinds of knowledge modules are available today, but not many and not enough. Many more are needed.

A convenient way of conceptualizing workforce learning is to think in terms of "industries," and to further inquire if industry-specific learning resources are widely available online for access by workers in that industry, or for those who seek skilled positions in that industry. I would like to describe one Sloan project that aims for impact by industry.

In 1998, supported by a Sloan Foundation grant, the Council for Adult and Experiential Learning (CAEL), convened a series of meetings with representatives of the major telecommunications services providers (NYNEX, Bell Atlantic, U.S. West, Ameritech and SBC) and representatives of the unions for the telecommunications industry (CWA and IBEW) to agree on a curriculum, governance structure, and an education institution to provide an A.S. degree for industry workers and those who wish to enter the industry. These meetings were successful in their purpose. A curriculum was agreed to and Pace University in New York was selected to develop all courses and to deliver them online and to be the degree provider. A governance structure was also agreed to (the informal industry/unions committee was re-constituted as NACTEL, the National Coalition for Telecommunications Education and Learning, and NACTEL oversees all aspects of the program, now in place). In this task, NACTEL is assisted by CAEL and by the Sloan Foundation, which provided initial funding to Pace, and CAEL. The first classes under the NACTEL program were given in 1999 (see www.nactel.org). Since then the program has seen approximately 2000 enrollments, and has a target of enrolling over 5000 learners by Y/E 2001. The results so far, reflect a very high level of satisfaction by workers who have enrolled, and a course completion rate of 83%, or about equivalent campus results for similar curricula.

So far, only union members and employees of the participating companies are in classes, but once the program has gone beyond the start-up phase, it will be expanded to a larger audience. None of the initial founding partners, companies or unions, have dropped out, though the list of participating companies is shorter due to consolidation in the industry. Citizens Communications recently applied for and received membership in NACTEL. NACTEL is in the process of establishing itself as a non-profit corporate entity, and is already exploring new kinds of educational offerings for this industry. They expect to seek additional funding from Sloan for new programs, but over time, they will attempt to become self-sufficient. The program has been further strengthened by a grant from the Department of Education's LAAP program administered by their Fund for Improvement of Post-Secondary Education (FIPSE).

Meanwhile, the Sloan Foundation has already provided grant support to CAEL to begin discussions with the Electric Utilities industry about a similar program, and additional grants are being considered for Airlines, the Auto Industry, Construction, and Financial Services. One grant has been awarded to the Association of Joint Labor/Management Educational programs in New York, to explore the possibility of NACTEL-like programs for selected State Government employees.

We should think of these efforts as only a beginning. Industry-specific offerings are an important way to ensure workforce learning, and offered in asynchronous online fashion, anytime, anyplace, they are a solution to the need for more family-friendly ways for workers to acquire education and training. Many

more such programs are needed, far more than Sloan or any other private funder can provide. NACTEL delivery is entirely in the interactive mode.

VI.   POLICY RECOMMENDATIONS

OVERALL RECOMMENDATION: Our experience with the interactive model of online learning shows that this way of teaching works. It enables quality education to reach out to vast numbers of people that otherwise would be denied education and training. The Government, whether in tuition support, fellowships, or support of training should support quality online learning as it does classroom learning. Quality, not mode of delivery should become the criterion for aid, recognition and support.

VII.   ABOUT THE AUTHOR

Prior to coming to the Sloan Foundation, Frank Mayadas spent 27 years at the IBM Corporation. He was Vice President, Research Division, Technical Plans and Controls, from 1991 to 1992; Vice President, Technology and Solutions Development, Application Solutions Line of Business, from 1989 to 991; General Manager, University and College Systems, IBM Personal Systems Line of Business, from 1988 to 1989; Secretary of IBM's corporate Management Board and the IBM Management Committee, from 1987 to 1988; and IBM Research Division Vice President and Director, Almaden Research Center, San Jose, California, from 1983 to 1987; and an IBM Research Division Director, Technical Planning and Controls, from 1981 to 1983.

He received a Ph.D. in Applied Physics from Cornell in 1965; and a B.S. from the Colorado School of Mines in 1961. He has over 35 published papers in Systems, Devices, and Solid State Physics, and holds several patents, and awards from IBM. He is a Fellow of the IEEE, a member of the American Physical Society, and a past Director of the Society of Engineering Science. He is also a member of the National Advisory Board for Georgia Tech, and the Advisory Board of the College of Engineering, University of Illinois at Urbana-Champaign.

His areas of Sloan Program Interest include: Careers, Learning Outside the Classroom (Asynchronous Learning Networks), Universities and the Economy, Globalization, Industry Studies, and the Scientific and Technical Work Force.