

New Global Initiative in E-Learning from MIT: Learning International Network Consortium (LINC) Project

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Abstract: The Learning International Network Consortium (LINC) is a MIT-managed project starting its activities in the year 2003. It is an international consortium of universities, foundations, government agencies and private firms. The purpose of LINC is to help facilitate the implementation of world-class tertiary education in developing countries, leveraging advanced technologies. As LINC's first activity, a workshop was held on Feb, 2003 at MIT with 85 participants from 19 different countries. During this workshop, participants discussed how to bring higher education to developing countries. Given sufficient funding, LINC will support programmatic projects such as the Fulbright Scholars program, the Harvard Kennedy School's Global Network for Innovative Government, and major e-learning initiatives at MIT. Each will help change and redirect efforts toward LINC. In that way LINC should become a major factor in bringing scalable and sustainable e-learning to many parts of the world.

The Current Problem

Gifted and motivated students need higher education to fulfill their potential. And in this information-based global economy a citizenry equipped with a solid education – through the tertiary level -- is a key to a nation's success. In much of the developing world, higher education is not available or offered to significant portions of the population. In some cases, this is due to lack of resources – qualified teachers, necessary infrastructure and capital. In most of the developing world, less than 5 percent of young people receive post-secondary education, in contrast to nearly 50 percent in the US.

There are many reasons for encouraging and growing e-learning efforts throughout the developing world. Among them are:

1. Brick and mortar universities cannot grow at the same rate as the youth populations that require education. A new university of this type would have to be built every two weeks to retain the current level of those now enrolled worldwide in undergraduate degree educational programs. If designed and scaled correctly and leveraging economies of scale, technology-delivered education can be delivered at a fraction of the cost of traditional classroom education.
2. Developing countries do not have sufficient numbers of qualified professionals to server as teachers, faculty and mentors. New technologies can serve as 'teacher multipliers' -- allowing those who are qualified to reach large populations.
3. When studying overseas, university students from different countries often see each other as supportive friends and educational collaborators -- thereby enhancing understanding across cultures.
4. Without some feasible systems for educating the youth of developing nations, those countries are likely to fall further behind the developed world in terms of economic growth and prosperity.

Goals

Motivated by the above issues, we have created the Learning International Network Consortium (LINC), an international consortium of colleges and universities, foundations, government agencies and private firms, to be managed initially from MIT. By empowering local professionals to implement high quality e-learning in their respective countries, the Consortium will eventually bring world-class educational opportunities to those who have not had access to quality education. LINC is envisaged to be a voluntary super-network and resource center

connecting and building upon individual national and international efforts currently underway. LINC is different from existing organizations for the following reasons:

- LINC is open, voluntary and inclusive, seeking to become an important “community of practice.”
- LINC welcomes research as a means of educating and of systematic improvement.
- LINC creates a global trusting community of scholars and practitioners in technology-enabled education.
- LINC is a learning organization, seeking to gain ‘lessons learned’ from its members.
- LINC’s top short-term objective is empowering local professionals to take control of their own e-learning needs.
- LINC’s top long-term objective is to help facilitate the offering of world-class educational opportunities to a growing fraction of the world’s young people.

LINC’s initial goal is to establish a sustainable international consortium supporting the creation and distribution of a variety of educational content both intra-country and across national boundaries.

The LINC Inaugural Workshop

As LINC’s first activity, a workshop was held on Feb 6-7, 2003 at MIT with 85 participants from 19 different countries. During this two-day event at MIT, participants discussed how to bring higher education to developing countries using distance-learning technologies. In addition to the United States, the countries represented included: Algeria, Armenia, Canada, France, Hong Kong, Japan, India, Ireland, Iran, Israel, Kenya, Mexico, Niger, Pakistan, Russia, Syria, the United Arab Emirates and Venezuela. Participants included, in addition to senior MIT faculty and staff, rectors and other leaders of virtual universities, policy makers from USAID, the World Bank, and senior professionals from corporations and foundations. Senior faculty members from several other US universities were also present. The workshop provided a unique opportunity to look into the work of many diverse organizations to use technology for learning and to hear and understand the diverse contexts within which these organizations work.

A common theme through the conference was an uncompromising enthusiasm for how e-learning and educational technology can make a difference in the world to reduce the gap between those who have access to education and those who do not. A diverse gathering of people from countries with different outlooks and perspectives met at a time of considerable political uncertainty to work for a common purpose. Through two-day intensive workshop periods, participants learned, shared and discussed one other’s domestic situations, problems and future directions.

On the first day 34 speakers presented in an intensive schedule going from 8:00 AM to 10:00 PM. . The presentations included:

- Developments in virtual learning at the Technion Institute of Technology, Israel;
- E-Learning plans at Sharif Virtual University in Iran;
- Opening of the Virtual University of Pakistan;
- Plans for the Syrian Virtual University;
- Challenges and prospects of the African Virtual University, in Nairobi, Kenya;
- Plans for e-learning in Armenia;
- The state of e-learning in China,
- Monterrey Tech’s Virtual University in Monterrey, Mexico; and
- The current state of distance learning in Algeria.

Moreover, some presentations showed their already adapting technology to reduce the educational divide and to make learning resources accessible to a much wider global audience. In India, for example, the PicoPeta Simputer is an inexpensive hand-held computer designed for elementary school aged children. Based on the information Markup Language (IML) it permits simple user interfaces based on sight, touch and audio. At MIT, students can expand their amount of hands-on learning via the Microelectronics WebLab <http://weblab.mit.edu/>. Although web labs do not totally replace physical lab experiences, they broaden the student’s overall experience and

allow sharing of lab resources at small marginal cost. MIT has already shared its WebLab with university students in Singapore and Sweden.

Participants from different countries who met for the first time at the Workshop have already made travel plans to meet with each other and to design new international educational collaborations. Professor Jesus del Alamo of the MIT Microelectronics WebLab discussed collaboration with leadership of the African Virtual University even before the workshop was over, for example. This supports our concept of LINC as an important Community of Practice.

On the second day of the LINC Workshop, a panel of students reported on four specific projects that, given sufficient funding, could be expanded to reach wider audiences globally. A private sector roundtable of five panelists demonstrated web-learning projects that gave wide access to educational material free and open to the public. Finally, a foundation roundtable pointed to the ways that philanthropy can make a difference. Four breakout groups looked at the operational and financial needs of LINC and the vision for the future.

After the discussion of four breakout groups' presentation, participants were given an assignment that would be the preparation of a White Paper that could make LINC a reality and help achieve its goals. Initially, once substantially funded, LINC will support the following types of activities:

- An annual international symposium on best practices in e-learning
- Publications, including a magazine reporting case studies and a refereed journal reporting on LINC-relevant research
- A collaborative interactive web site that will support those who are focusing on LINC-related activities
- R&D projects in developing countries aimed at new initiatives such as alternative pedagogical models in e-learning
- Provision of technical assistance in 'training the trainers,' who will serve as initial key e-learning personnel in a country
- Involvement of college and university students in developed countries in internships on e-learning in developing countries
- Creation of collaborative educational web sites to which all LINC members can contribute and from which all can access contributed materials
- Identifying and encouraging foundations, private firms and governmental institutions that may want to scale up one or more LINC-supported starter projects to significant size.
- Facilitating the matching of expert resources to the e-learning needs of any particular LINC member

After returning home, LINC Workshop participants completed via email a workshop evaluation survey. The full results are posted on the LINC web site. <http://ken.mit.edu/linc/> Here are illustrative examples to an open-ended question. "In my opinion, LINC's inaugural workshop was very professionally run, bringing the second best meeting that happened since 1660 when the Royal Society was formed." "Together leaders from a diverse and unusual mix of leaders from educational institutions from around the world. This consortium should grow and become a primary source for insight and coordination of the evolving global marketplace for learning and research activities."

The response of the LINC workshop participants has been overwhelmingly positive. The participants all seem to want LINC to move to the next level as a unique community of practice to support higher education in emerging countries.

Programmatic Initiatives

Given sufficient funding, LINC will also support programmatic projects. We have proposed an initial six projects, as described briefly below.

X.1. Students Training the Trainers in Africa

The MIT African Internet Technology Initiative (AITI, < <http://web.mit.edu/mit-africa/AITI/aiti.html>>) is a small student-created effort to bring Internet expertise to young Africans. Africa needs programs that help promote computer technology and the utilization of the many resources available on the web. AITI aims to establish programs in African colleges that teach students the importance of the web while equipping them with innovative skills. The idea is that African students who are being educated in the USA can, in a spirit of volunteerism, return as 'summer interns' to their home countries in Africa and educate others in the technical material learned abroad. Eventually this knowledge can be channeled into creating a human infrastructure capable of supporting distance learning and related LINC-relevant initiatives.

The inaugural project was implemented in the summer of 2000 at Strathmore College in Kenya. The project doubled in size in 2001, implemented at two African colleges. This summer it will continue to expand, on essentially very limited funding. With sufficient funding LINC seeks to channel a limited amount of grant funds (\$50,000) to scale the program to several additional African colleges, a critical developmental step to attract additional outside support. Professor Paul Gray, former President of MIT and former Chairman of the Board, is a faculty mentor for this innovative and important project.

X.2. Fulbright Scholars as Change Agents

MIT and the Institute for International Education (IIE) have agreed to collaborate under LINC to accomplish several important missions. They include exposing all 4,000 Fulbright Scholars annually to LINC concepts and ideas, and training scholars from abroad to act as change agents when they return home. LINC can provide a web environment for communication, collaboration and education. But at this time, with limited funding and a primary focus on prototype projects, we describe below a compelling LINC – IIE program in which IIE has pledged to invest financially --- once the LINC funding is established.

The LINC initiative focuses on the Fulbright Alumni Initiatives Awards (AIA) Program. Its objective is to help Fulbright alumni to translate their individual Fulbright experience into institutional impact. AIA grants, which are institutional awards, provide seed funding for projects that will create sustainable, mutually beneficial institutional linkages and relationships between the scholar's home and host institutions, usually colleges or universities. Participating institutions are expected to demonstrate a commitment to seeing the linkage supported after the AIA funding has terminated. Proposals for AIA funding can be initiated by either a US Fulbright alum or a non-US Fulbright alum, but must be prepared and submitted jointly with the alum's host institution and administered through the US institution¹. The competition will be announced in June 2002 with a February 2003 deadline and projects can begin at any time after that. The maximum award amount is \$25,000. Once all necessary funding is in place, the competition will be announced on the CIES web site at: <<http://www.cies.org/aia.htm>>.

AIA with LINC will generate innovative four prototype projects. Four awards at \$25,000 each will be targeted specifically for e-learning proposals. These will be advertised as a separate component of the program. They will be offered for projects in selected countries (i.e. those with the appropriate infrastructure and technological capabilities) and with specific guidelines to ensure that the project has a strong chance of being implemented. IIE will contribute matching funds to this initiative.

In addition, funding from APS-LINC will be provided to offer the successful awardees, both US and non-US, a learning/training opportunity through MIT. Awardees will be given the opportunity to participate in a workshop with information technology specialists who might critique and help them fine tune their projects as well as help them develop realistic action plans to implement their projects. This will provide the awardees with an opportunity to hone their skills, focus on any potential problems and devise strategies for dealing with them. Such a workshop will be an essential component in ensuring the ultimate success of the project.

¹ These US institutions are typically colleges or universities in the US.

X.3. World Sharing of Architecture and Urban Planning Best Practices

MIT faculty members have made many visits to the developing world. Several have spent years there on location doing research. They are convinced that a great deal of interest exists in those countries for current best thinking in architecture and urban planning. To fulfill this need, we will systematically begin to capture highest quality visiting lectures, colloquia and seminars in Architecture and Urban Studies and Planning given at MIT, and make these available online and by CD. At MIT we are currently conducting a pilot of this idea, videotaping *The Resilient City* series² < <http://resilientcity.mit.edu> > as part of the *MIT World* repository <http://web.mit.edu/mitworld/>.

Architectural and planning students, academics, and practitioners in the developing world generally do not have ready access to the sort of cutting-edge discussion and debate that emerges at these events, and they are hungry for it. As a prototype LINC project, we will undertake a program of capturing, organizing and indexing, and distributing such material. For those with no Internet connections, we will make available a limited number of CDs containing this material.

X.4. Silk Road in a Web-Shared Environment

Under this prototype LINC project, MIT's Professor Peter Perdue³ would extend some of his current research on Asia and the Middle East into a sharable web learning environment. He is currently at an advanced stage of writing a book on the history of what has been called the Silk Road⁴, linking Europe through historical trade routes to East Asia. Images, photographs and text would be placed in an informed and searchable way onto the web site. He would focus particular emphasis on creating an open environment in which people could hold threaded discussions and even contribute their own content in the form of text and images. Under this project, major universities on and near the Silk Road would be contacted and alerted to the project. They would be asked if they would like to contribute to it. We would hope to engage several such universities in this way, communicating with them via the Internet and videoconferencing and contributing to an exchange of ideas between students living in different cultures.

X.5. Good Clinical Practices for the Developing World

Pfizer Corporation has invested about \$500,000 in a CAES MIT production of a web site nearing final release: *Good Practices in Clinical Research* (or 'GCP'). We wish to leverage this investment and apply it to practicing physicians in Sub-Saharan Africa.

Within months, physicians in Latin America will be able to train and become qualified as clinical researchers through the new interactive and bilingual web-based GCP course. A joint project of CAES, the Pfizer Corporation, and The Center for Experimental Pharmacology and Therapeutics at Harvard MIT Division of Health Sciences and Technology, this asynchronous material is available in English and Spanish and is compliant with the American for Disabilities Act. The educational web site includes topics such as a historical overview of clinical research, ethical considerations, pre and post trial considerations, conducting clinical trials and the future of clinical research.

GCP reaches across the digital divide and brings world-class instructors to medical researchers so that new medicines can be discovered and lives can be saved. By adding to the numbers of physicians who are qualified to help undertake clinical research, it will also help to develop faster drug treatments for all sorts of serious diseases.

² From their web site, MIT's Resilient City project was conceived in response to the terrorist attacks that destroyed New York's World Trade Center on September 11, 2001. Intended as both a scholarly and therapeutic exercise, the colloquium examines critically how cities in the past have endured traumatic episodes, and prevailed to establish new order out of chaos and devastation. In this series of public lectures, we will attempt to understand the economic, artistic, political, social and cultural forces that have enabled cities to rebuild and recover, and in the process develop a framework for understanding both the commonalities and differences inherent in post-traumatic urbanism. To do so we investigate a diverse selection of examples of urban trauma, recovery, and remembrance from around the world.

³ His web site is <http://mit.edu/pasperdue/www/>.

⁴ See for instance <http://www.ess.uci.edu/~oliver/silk.html> and <http://library.thinkquest.org/13406/sr/>.

The CAES-produced GCP web site transformed a seven-day course formerly delivered “face to face” to physicians in Latin American countries. “Face to face” is not scalable, whereas web-based delivery is. The resulting GCP course is the first in a series that will eventually become freely available to the developing world. Renowned physicians and researchers at MIT, the Joslin Diabetes Center, the Costa Rican Institute of Clinical Research and Pfizer have contributed to *Good Clinical Practices* as well as various groups at MIT including CAES, the Academic Media Production Services (AMPS), HST and faculty from the Humanities Department.

The goals of the program are to: provide the tools needed by clinical investigators; create a network of investigators both linked to each other and the pharmaceutical industry; and make a contribution to medical education. The web site is also designed to address major obstacles in conducting clinical research in developing countries including lack of well-trained clinical investigators and a defined regulatory framework.

As a LINC prototype project we will translate GCP into French and to make it available to 15 Sub-Saharan African countries via the African Virtual University. The effort would most likely take the form of sending the (translated) GCP course to each of about 20 AVL ‘Learning Centers’ in Africa, in both French-speaking and English-speaking countries. Then there would follow training local trainers in the material via AVL satellite links, exposing physicians to the material in the training centers and then holding several live interactive questions and answer sessions with our GCP experts in Cambridge, Massachusetts. A rigorous certification program will be put in place, should any of the physicians taking the course wish to become certified clinical researchers. If successful, we would hope to translate this into Arabic and other languages.

X.6. Kennedy School’s Global Network for Innovative Government

The LINC prototype program we are about to describe is, like the IIE program, leveraging investments and programs already in place at a major highly respected institution. The Kennedy School’s Institute for Government Innovation is designing the Global Network for Innovative Government, an interactive hub for creating and sharing knowledge among public-sector leaders and practitioners from around the world. To accomplish this, the Global Network will integrate:

- A custom-developed, high-end Web portal with multiple language translation capability, which will serve as a repository of filtered and vetted information.
- A structured and supported interaction and collaborative network among people who live and work across distinct geographical, institutional, and jurisdictional locations. This type of guided and supported interaction enables the creation of “Communities of Practice.”⁵

Communities of Practice convene people who share a common practice around a specific enterprise. Historically they have taken many forms, ranging from medieval trade guilds, to multi-national company “knowledge management systems” and cross-institutional communities such as the World Bank’s Urban Services Thematic Group. Deliberate support of such a community’s efforts to share, validate, learn and create new information is a powerful way to transfer best practices and to disseminate innovation.

The Institute will offer a venue for existing and new Communities of Practice supported by a technology platform and communication tools, and guided by leadership from Harvard and partner institutions such as MIT. The technology platforms to accomplish this online already exist and are user-friendly.⁶ The Institute’s role is as convener, supporter, and provider of structure and tools. The communities themselves carry out the prioritization of needs, learning, and production and dissemination of information. Institute faculty and researchers will share their expertise in relevant policy areas.

⁵ For the most current and comprehensive explanation of Communities of Practice, see “Cultivating Communities of Practice” by Wenger, Snyder, and McDermott, Harvard Business School Publishing, 2002.

⁶ Century “Centra” and CommunaSpace are two examples of software products that integrate collaborative work production with communication across the Internet. The Institute will also provide the Communities with orientation and IT support.

Summary

We are already seeing significant leveraging of programs already in place and highly respected, i.e., the Fulbright Scholars program, the Kennedy School's Global Network for Innovative Government, and major e-learning initiatives at MIT. Each will help change and redirect a portion of its efforts towards LINC. In that way LINC should become a major factor in bringing scalable and sustainable e-learning to many parts of the world.