

CREATING GLOBAL UNIVERSITY SYSTEM

Takeshi Utsumi, P. Tapio Varis, and W. R. Klemm

Abstract

The Global University System (GUS) is a worldwide initiative to create satellite/wireless telecommunications infrastructure and educational programs for access to educational resources across national and cultural boundaries for global peace. The GUS helps higher educational institutions in remote/rural areas of developing countries to deploy broadband Internet in order for them to close the digital divide and act as the knowledge center of their community for the eradication of poverty and isolation. The GUS has task forces working in the major regions of the globe with partnerships of higher education and healthcare institutions. Learners in these regions will be able to take their courses, via advanced broadband Internet, from member institutions around the world to receive a GUS degree. These learners and their professors from participating institutions will form a global forum for exchange of ideas and information and for conducting collaborative research and development. The aim is to achieve "education and healthcare for all," anywhere, anytime and at any pace.

Vision

Economic interdependence among nations and cultures is spawning a global economy. Such globalization inevitably magnifies the negative consequences of population growth, environmental degradation, and the unequal distribution of resources and wealth among nations. Globalization also promotes clashes of divergent cultures and belief systems, political and religious.

As a result, wars and rumors of wars abound. If global peace is ever to be achieved, global-scale education with the use of the modern digital telecommunications will be needed to create mutual understanding among nations, cultures, ethnic groups, and religions. The Internet is the future of telecommunications and can be a medium for building peace.

We also need to help people develop the personal and collective competencies that are needed to compete for excellence in a global economy. Education and job skills are the keys in determining a nation's wealth and influence. At the ultimate stage, competition among nations will be competition among educational systems (Rosecrance, 1999).

GUS aims to provide global education in the broad context of wisdom, justice, and peace. It is not enough to educate people with knowledge and marketable skills if they live in a culture that is ill-suited to accommodate the hopes and dreams that such education inspires. Indeed, cultural disconnects with modern

education may lead to frustration, despair, and perhaps ultimately to war or terrorism. A GUS education thus will promote world prosperity, justice, and peace, based on moral principles rather than political or ideological doctrines.

Most universities in the developed world have a growing capability for e-learning at a distance. As universities expand their distance learning modules and courses, their student "market" expands, but is constrained ultimately by the limitations of telecommunications and educational administration in underdeveloped countries. Yet these are often the countries with the largest populations and with the greatest need for modern education. GUS is formed to help bridge this gap.

Mission Statement

The globalization of society and the rise of a knowledge-based economy have been combined in the past decade to impose drastically raised expectations upon higher education institutions. Governments and corporations look to universities for innovative uses of new information technologies in teaching and administration. This vision of the new university emphasizes more than before the role of market forces in shaping the institution, the need to respond to users' needs, and the need to deliver knowledge continuously through lifelong e-learning. However, the vast majority of universities, as well as the public and private organizations they work with, are unprepared to reorganize themselves to address these new demands ([Jacobs, J. S., 2002](#)).

The mission of GUS has three specific thrusts, to:

- Identify, test, and facilitate the deployment of broadband Internet and related technologies that are affordable and accessible for underdeveloped areas of the world,
- Coordinate the delivery of content and rich educational experiences leading to a GUS degree,
- Provide a global infrastructure for collaboration among faculty, students, graduates, and policy makers in universities, healthcare institutions, corporations, and governments.

GUS aims to help equip youngsters around the world to be competitive and to strive for excellence. GUS aims to prepare them for a world that seems to be changing from the industrial age where obedience predominated to a knowledge age where creativity and competence prevail.

Philosophies and Principles of GUS

The philosophies and principles of the GUS are set forth in the following eight propositions ([Utsumi, Rossman, Rosen, 1990](#)).

Transcultural, Globalwide Initiative

The highest priority of the GUS is to launch a transcultural, globalwide initiative (using modern techniques of communication) to promote the kinds of global education that will advance peace, justice, understanding, and human wisdom. The GUS seeks to encourage a sense of transnational identity, a feeling of global

community, which is necessary for the survival, creative growth and constructive transformation of our species. Indeed, the survival of our globe itself may depend on such transformation. All those who participate in the GUS will share a firm commitment to the goals set forth, and pledge to pursue them with ongoing vigor. In asking members to affirm and support our agreed-upon aims, we follow the charter of the United Nations. However a lesson may also be learned from disappointments encountered in the UN experience. Bearing these in mind, we shall address the task of *implementing* the stated goals; bridging the gap between principle and practice, long-range plans and short-term actions, and dreams for the future and present realities.

Education for Moral Leadership

The GUS has no intention of dictating morality to its participants. It will encourage free and open dialog among those with differing opinions and outlooks. But, in view of the challenges confronting humankind at this critical juncture in its history, it behooves us to demonstrate moral leadership in the various activities we undertake. The GUS will not enter into partnership with any institution planning to use its power for objectives such as the waging of war or the oppression of its citizens. A policy of the GUS is to offer courses, programs, or practices that are compatible with the interests of global understanding and accord. Moreover, the GUS intends to show moral leadership in a *positive* manner by promoting curricula and activities, such as peace gaming and global village meetings that will facilitate global harmony directly. The GUS hopes to play an active and meaningful role in addressing the manifold difficulties facing humankind - war, pollution, disease, hunger - by fostering an attitude of trust, empathy and compassion, a sense of solidarity and global identity.

Priority on Academic Freedom

In a world now fragmented by hosts of competing special interests, a globe endangered by the tribal rivalries of the nation-states, we affirm our university as a place where teaching and thinking are given free reign to be truly ecological - to address problems and crises global in scope. If the "zero sum game" is no longer winnable, if the globe is shrinking to the point where a crisis anywhere is a crisis everywhere, we require the latitude to think globally, bound neither by the motives of profit nor power. In short, the GUS espouses academic freedom as an essential value. We trust that those who support us will pledge to uphold this cherished principle.

Emphasis on Quality Education

The GUS will place an emphasis on quality in all its programs and courses of instruction. It will draw its curriculum from known centers of learning around the world and seek to identify new centers of excellence and creative scholarship. The undertakings of the GUS will include the most up-to-date research and methods, the most recent developments and insights in its various fields of study, and will be supported and enhanced by the latest advances in communication technology. To respond to the immediate needs of its students, the GUS will offer culturally relevant educational experiences not readily available in local institutions, perhaps not available through any other means but an electronic university, that is interactive in nature and global in scope.

At the same time, the GUS will remain cognizant of the *collective* needs of the globe. Recognizing that the welter of newly generated information and technologies can itself constitute a significant problem for

humankind as a whole, the GUS will seek to temper the fragmentizing effects of contemporary innovation. The GUS will encourage curricula in which the latest facts and newest techniques are grounded and integrated with the wisdom of our *oldest* traditions, holistic and ecological approaches found at the core of every native culture on the globe. Accordingly, the GUS will define a "*quality education*" as one that promotes an integration of the social, economic, political, and spiritual insights of East and West, North and South, masculine and feminine - encompassing the wisdom of the past, the richness of cultural diversity and the transformative potentialities of the present and future. An education of high quality must give students the most powerful tools of thought accessible to them; it must give them the fullest and clearest version of the facts; and it must interpret the facts, as analyzed by the tools, in accordance with the best-articulated system of values available. The GUS will exhibit respect for freedom and dignity by giving many cultures the opportunity to express themselves in their own best terms.

Responsiveness to Student Needs and Aspirations

The GUS partnership of universities, businesses, governmental, nongovernmental, and community organizations will be guided by, and remain fully responsive to, the felt needs and stated aspirations of students, workers and individual citizens around the globe. The GUS will search for ways to make it possible for persons of any means in any region of the world to have the opportunity to obtain a high quality education. We dedicate ourselves to the promotion of literacy and lifelong learning, so that global economic equity and employment flexibility may be achieved. Moreover, we pledge our educational resources to the advancement of scholarship and creative growth on a global basis.

Transnational Collaboration on Research

The GUS will work diligently to help make it possible for researchers in significant fields of study to collaborate across national boundaries, engaging in joint research projects facilitated by computer, telecommunication and information technologies. A rich new interplay of disciplines and schools of thought is possible through such electronic cooperation and interchange. By bringing many minds together through computer networking and conferencing, our "*collective intelligence*" can be brought to bear in exploring fresh approaches to global issues.

But the global problems to be addressed include widespread human suffering: physical, emotional and spiritual anguish, and distress. This suggests that exchanges between and among researchers, faculty and students must be more than intellectual. An *affective* component seems required. Through intercultural transactions in the arts and humanities, through more intimate interpersonal exchanges, the *heart* must be engaged as well as the mind. If compassion, trust and empathy are to be fostered, if a sense of global solidarity is to be attained, we must be willing to share our feelings as well as our ideas.

Commitment to Openness

The GUS endorses the precept of unrestricted access to all information and educational resources at its disposal. To advance this goal, it will sponsor a space-station library system that will be open to any educational institution, group, network or individual anywhere in the world. The GUS will facilitate the free exchange of ideas and insights around the globe and then strive to maintain openness at every level of its own operations.

Cultural Sensitivity Without Fragmentation or Homogenization

The GUS is committed to the goal of counteracting the depersonalizing effects of mass technology. But rather than limiting itself to the aim of meeting the purely personal needs of its participants, GUS hopes that its educational programs will encourage a sharing of minds and hearts across personal, disciplinary, scientific and cultural barriers. Both in the formal courses of instruction and in the post-graduate networks of colleagues that emerge from a GUS education, we hope to promote awareness of cultural diversity without encouraging either cultural fragmentation or cultural homogenization, as performing a dynamic *synthesis* of unity and diversity, a transcultural *unity-in-difference*.

Goals

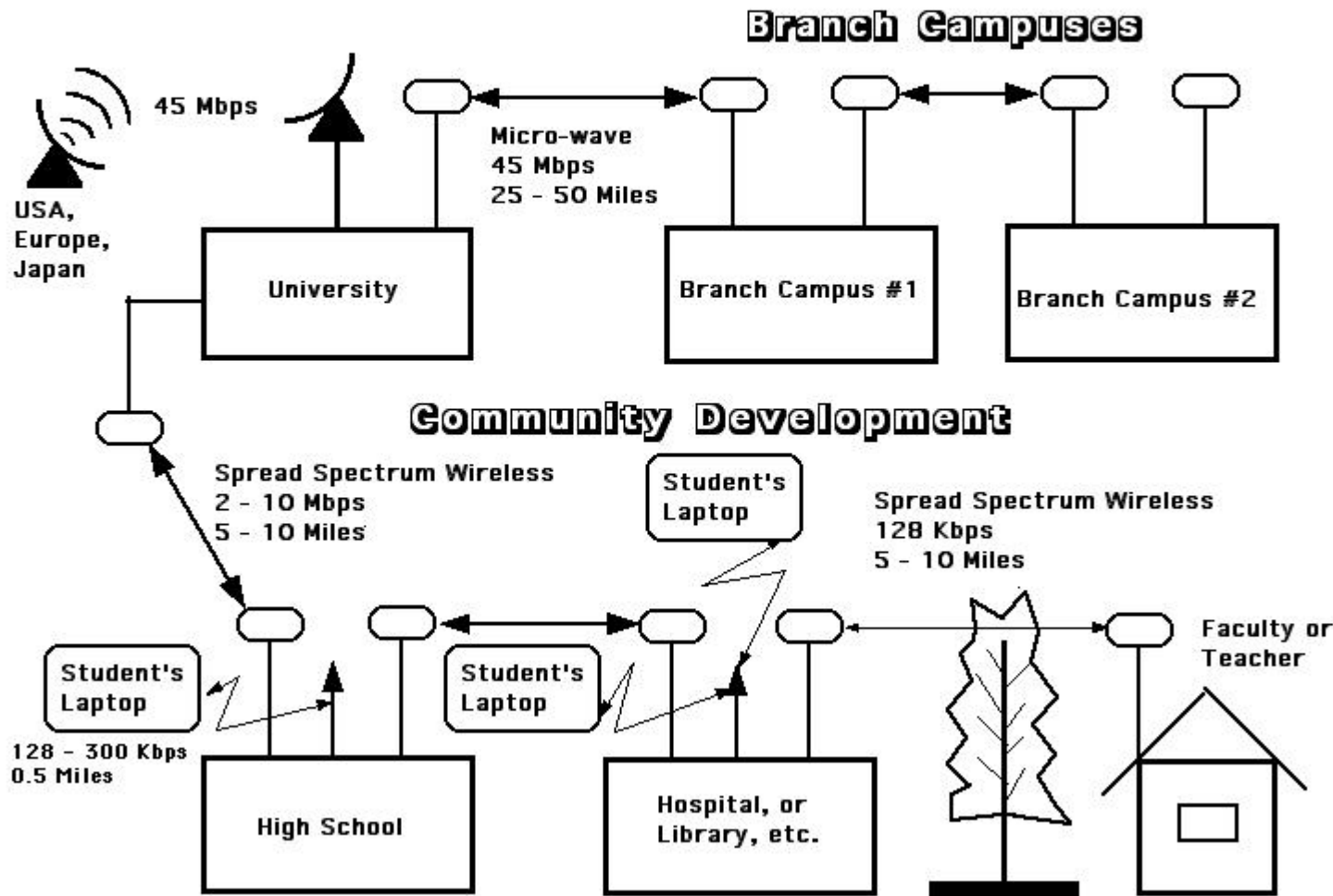
The infrastructure needed for implementing GUS, if developed in traditional bricks-and-mortar ways, is not economically feasible in many under-developed parts of the world. Viable initiatives must rely heavily on the Internet and associated technologies. Toward that end, GUS has been testing satellite/wireless broadband Internet to provide access to the educational resources available at participating institutions.

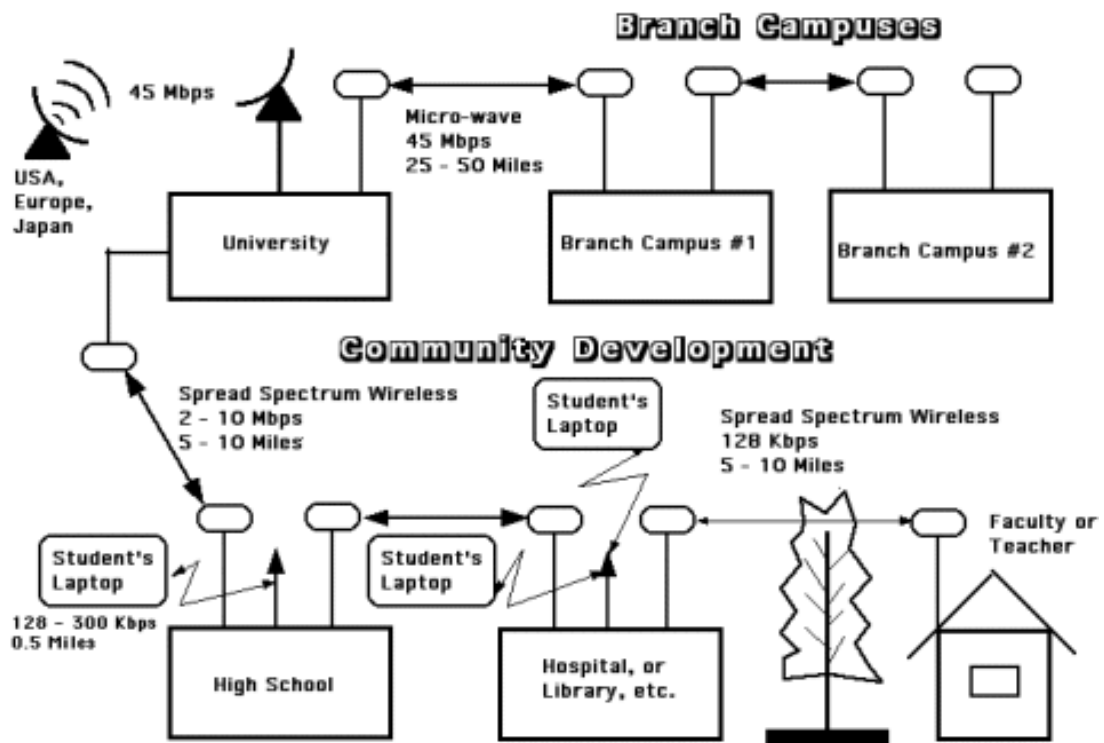
Modern e-learning and telemedicine require high-speed access to the World Wide Web. Multi-media requirements might include two-way audio, full-motion videoconferencing up to MPEG4 quality, television-quality netcasting, and high-resolution image transfer for telemedicine. The objective of increasing quality of audio/video delivery, high interactivity, and broadband throughput can be seen as a global objective of closing the digital divide to improve e-learning and e-healthcare services in order to eradicate poverty and isolation in rural/remote areas of developing countries ([Utsumi, Varis, Knight, Method, Pelton, 2001](#)).

As diagrammed in Figure 1, GUS will be based on regional satellite hubs, typically located at a major university, that connect via high-speed satellite (~ 45 Mbps) to educational resource cites in the E.U., U.S., and Japan. In a sense, the regional satellite hub is to be the major Internet Service Provider (ISP) for not-for-profit organizations in the region, and the gateway to the outside world.

Figure 1
([Click here for larger diagram.](#))

Global Broadband Wireless and Satellite Internet Virtual Private Network (11-9-02)





Regional hubs link to branch campuses or other regional educational institutions via micro-wave (~ 45 Mbps) over relatively short distances (25-50 miles). Communication from the hub and branch campuses to local sites, over distances up to 10 miles, is to be achieved by spread-spectrum wireless (~ 2-10 Mbps) Internet networks, which do not require licenses in most countries. The buildings with a broadband Internet connection will then also become relay points for the low-cost "Wi-Fi (wireless fidelity)" networks at 10 Mbps that are now rapidly appearing in Japan, USA and Europe. This advanced wireless communication with laptop computer will make e-learning possible for anyone, anywhere, and anytime with capabilities of Internet telephony, fax, voice mail, e-mail, Web access, videoconferencing, etc. This is not only to help local community development, but also to assure close cooperation among higher, middle and lower levels of education.

GUS is not limiting its efforts to university-level education. Some major U.S. universities are heavily involved in K-12 education as a means to assure quality in their student pipeline. The K-12 education in many underdeveloped nations is poor to non-existent, and they produce few students who are qualified to master a university education. The seeds of poverty and terrorism are sown in children through ignorance and indoctrination. What could be a more important problem to address? Leadership must come from the universities - including, hopefully, GUS. U.S.-based outreach programs such as those engaged in by author Klemm (see <http://peer.tamu.edu>), can be routed through the GUS broadband Internet networks. Many other federally funded educational resources have already been created, and all of these can be distributed to under-served countries via a partnership with GUS.

Organization

The ideas for GUS were conceived and originally developed by author Utsumi. GUS is currently headquartered at the [Global E-learning Center at the University of Tampere](#) in Finland, under the direction of author Varis.

Currently institutions with faculty members who are participating in GUS development projects include the University of Tampere, UK Open University, 6 federal universities of Amazonia, Havana Institute of Technology, University of Malawi in Africa, McGill University in Canada, University of Tennessee in Knoxville, Cornell University, Yale University, Harvard University, Johns Hopkins University, University of Michigan, Montana State University, Houston Community College, University of Hawaii, Maui Community College, University of Milan, Catalunyan Open University, Concordia International University in Estonia, NEXT (Generation) Project with European universities and global commercial organizations at Cancer Research U.K., and others. GUS will serve as an educational broker for universities, thus helping them gain international influence and access to students that they would otherwise not reach.

We are currently creating GUS in Amazon of Brazil, Cuba and the Caribbean region, and Malawi in Africa, and have received inquiries for the same from several South Asian and the Pacific countries. The GUS affiliated institutions will be invited to become members of our GUS/UNESCO/UNITWIN Networking Chair Program, located at the University of Tampere in Finland.

The model for GUS is the [National Technological University](#) (NTU) in Fort Collins, Co. NTU is a coalition of engineering departments of many universities - mostly in the US. Students anywhere can take courses from the coalition member universities but get their degree from NTU.

GUS differs mainly from NTU in that:

- GUS will use Internet, which is less expensive than the satellite approach of the NTU.
- Internet has the potential to be global compared with the regional coverage of satellite. The NTU satellite system, for example works only within North American continent, because of the coverage of the satellite footprint.
- Internet-based teaching can be totally asynchronous. It also enables more interaction among/between students and instructors compared with class-room teaching via satellite.
- The NTU's main goal is to enhance job-skills. GUS has the additional aim of promoting world prosperity, justice, and peace - in the spirit of the Fulbright exchange program, which helped to inspire the idea of GUS.

Another model is the [eArmyU](#) program of distance education that is administered for the U.S. Army under contract with IBM (Johnstone, 2003). The Army acts as a broker for on-line courses and degree programs offered by participating universities. This program went from an enrollment of 0 to 50,000 in just 2 years. While GUS will not have the resources of the U.S. Army or of IBM, we have similar core resources: namely, a cadre of distance education universities that the GUS can access for its students. IBM's role seems not so much as to act as a broker for eArmyU, but rather to provide "Customer Relationship Management," which tracks student progress, provides a Help Desk, arranges tutoring as needed via Smarthinking (an on-line tutoring company), and appoints an academic advisor. Such customer services will need to be included in GUS, and this is why we are now concentrating on the formation of strong partnership with higher

educational institutions in developing countries (see below) so that their faculties can act as facilitators to their students.

Creating broadband Internet infrastructure in remote parts of the world is daunting, but GUS is systematically accomplishing it through grants and liaisons with participating universities that have a vested interest in bringing their on-line courses to a larger student population. GUS and participating institutions have not yet worked out the matter of student fees, which will be a major problem for students in poor countries. GUS hopes to arrange support from national governments, local corporations, foundations, the U.N., as well as scholarships from the participating institutions, most of which have a vested interest in attracting foreign students and in expanding their international reach. The U.S. government spends over \$200 million every year for the Fulbright exchange program. Is it not therefore reasonable to expect G8 governments to spend some meaningful portion of their Official Development (ODA) funds for the fees of global e-learning of students in under-developed countries?

GUS is currently addressing the issue of how it will replace, substitute, or coordinate with existing commercial ISPs. At first, GUS will have private virtual networks among non-profit oriented universities, as following the model of ALOHA System of the University of Hawaii. The major university in a remote locality will be the main ISP. However, when the program gets large, we may outsource some of functions to commercial ISP for their helping the administration of broadband Internet infrastructure. In a sense, this is to follow the initial steps of the advent of ARPANET, the predecessor of Internet, which started with the packet-switching network (at only 64 Kbps) of 4 universities in the US in the late 1960s. This time, it will be with broadband Internet, global scale, and emphasis on its use with well-prepared and organized content for community (local, regional and global) developments. Academia will again be the leader for its development of the knowledge society in their localities.

The GUS position on language is to promote English as a world-unifying language, because it already is the *lingua franca* of commerce, science, and technology. Also, translation costs would be prohibitive. However, we also need to cherish the language and culture of the people of developing countries. Therefore, we need to deal with the issue of translation when and if we get enough funds or can arrange local volunteer translation services.

Expected Benefits

We can expect GUS to provide the following benefits to students and participating universities:

- Broadband Internet will support modern distance education via the World Wide Web.
- Member universities can build a network of facilitators to support of e-learners.
- Learners may take courses from member universities and get their degree from the GUS, thus freeing them from being confined to one academic culture of a single university and country.
- Learners and faculties can promote the exchange of ideas, information, knowledge, and joint research and development of Web-based teaching materials.
- Learners, faculties, and public policy makers can promote community development and many other advances locally, regionally and even on a global scale.
- Researchers in developing countries can partner with colleagues in advanced countries to perform joint collaborative research and development.

Implementation Activities

The GUS program is a comprehensive and holistic approach to building smart communities in developing countries for e-learning and e-healthcare/telemedicine. It may take decades to develop fully. Nonetheless, initiatives are underway to create necessary infrastructure and educational liaisons, and some near-term educational access is expected. Early efforts have included international teleconference technology workshops that have tested the satellite/wireless technology that will be used in GUS.

Early Implementation Plans

Deregulation of Japanese Telecom Policies.

Over the past three decades, GLOSAS/USA has played with substantial time, effort and its own private fund a major pioneering role in extending U.S. data communication networks to other countries, particularly to Japan, and deregulating Japanese telecommunication policies for the use of e-mail through ARPANET, Telenet and Internet (thanks to help from the Late Commerce Secretary Malcolm Baldrige) - which is now called "closing the digital divide." This triggered the de-monopolization and privatization of Japanese telecommunications industries. This liberalization of the telecommunication industry has been emulated and has now created a more enabling environment for economic and social development in many other countries. Over 180 countries have Internet access and more than 700 million people use e-mail around the world nowadays. American and other countries' university courses now reach many under-served developing countries.

"Global Lecture Hall (GLH)" Videoconferences.

Since 1986, we have organized and conducted a series of innovative distance teaching trials with multipoint-to-multipoint multimedia interactive videoconferences using hybrid delivery technologies, which often spanned the globe and came to be called the "[Global Lecture Hall \(GLH\)](#)"tm. The GLH employed inexpensive media accessible to less developed countries.

Thanks to such efforts and for initiating global e-learning movement since early 1980s, author Utsumi received the prestigious Lord Perry Award for Excellence in Distance Education in the fall of 1994 from Lord Perry, the founder of the U.K. Open University. The two-year senior recipient of the same award was Sir Arthur C. Clarke, the inventor of satellites.

The 1998 GLH was conducted in Manaus, Amazon, Brazil to demonstrate:

1. Parallel use of PowerPoint slides with audio conference (a professor at the University of Tokyo described his elaborate medical education system connecting about two dozen university hospitals in Japan with two-way digital satellites),
2. Point-to-point videoconferences via an inexpensive Internet connection between Manaus and Houston, and between Manaus and Ukraine,
3. Broadcast of those demonstrations with BRAZILSAT throughout South America.

About 200 attendees (university professors, K-12 school teachers, local government officers, etc.) witnessed their success, and firmly got the idea of the value of e-learning. We had a clear audio connection via the Internet during this event, because EMBRATEL installed three broadband Internet satellite linkages with the US just prior to this event.

Manaus was also the host site for the 2000 GLH, which featured the following demonstrations:

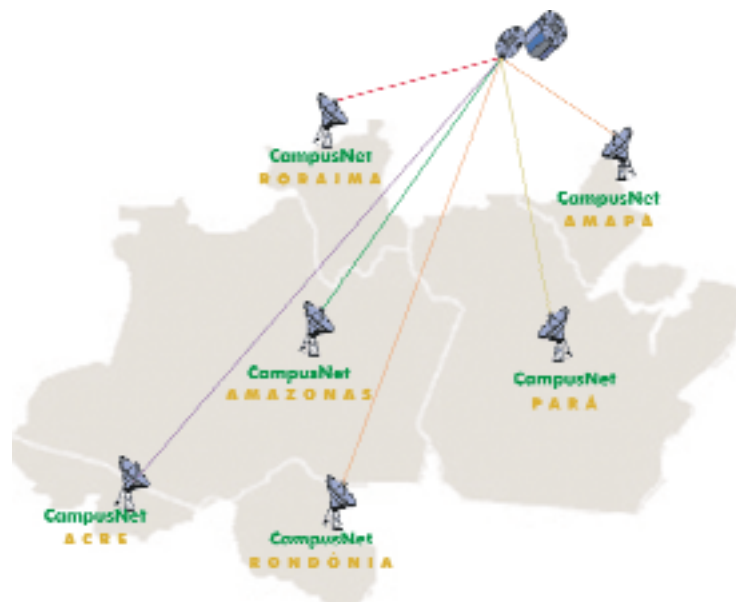
1. Telemedicine demo with the most advanced echocardiogram unit for diagnosis of a real patient by a heart specialist at the University of Michigan who gave valuable clinical suggestions to a local doctor,
2. Inexpensive videoconferences between Manaus and Houston, New York, England, etc., via narrow-band Internet,
3. Both of the above were broadcast via satellite throughout South America.

These events have stimulated interests in e-learning among secondary school teachers. After this event, our Brazilian colleague, Professor Alex Rivas of the Federal University of Amazonas, could form a CampusNet coalition of the six Federal Universities in the Amazon region - see below. This event also encouraged the University of Amazonas to purchase a videoconferencing unit, and they have conducted several events with their counterparts around Brazil and even in Spain.

Amazon Project with CampusNet and Community Development Networks.

GUS is currently seeking to develop a program in the Amazon region of Brazil with:

- CampusNet Amazonia which will interconnect Multimedia Resource Centers (MRCs) at the main campuses of all six Federal Public Universities and at their branch campuses in the localities of their states in Amazon areas via broadband satellite Internet, and





- Community Development Networks (CDNs) which will connect the universities with secondary and elementary schools, libraries, hospitals, local government offices and NGOs, etc., firstly in the City of Manaus and later in the cities of main campuses of the CampusNet affiliated universities by broadband wireless Internet.

Planned Manaus Workshop.

A planned international workshop at the University of Amazonas in Manaus is to brainstorm on and to form a committee for the deployment of broadband Internet in Amazon, Brazil. We will outline the preparatory works that will be conducted by the committee for about a half year after the workshop, and identify roles of the committee members. The works will plan necessary telecommunication configurations, their systems design, feasibility study, market survey and action plan of implementing the infrastructures, and the construction of their cost estimates for dish antenna, transceivers and satellite segments, design of organizational structures for technical support and administration, etc. The resultant comprehensive document is for applying for the ODA fund of the Japanese government - see below.

Manaus Community Development Network

We will start from the City of Manaus, and we have submitted our application (about US\$80,000) for the Grass Root Fund (GRF) to the Japanese Consulate in Manaus. This project (Manaus Community Development Network) will connect about a half dozen high schools (including the ones in poverty stricken areas of Manaus) with the University of Amazonas by fixed wireless spread spectrum Internet and Wi-Fi Internet units. One of them is a Japanese school for children of employees at many Japanese companies in Manaus. We plan to have them connected with their counterparts in Japan through e-mail, videoconferencing and Japanese web accessing free of charge. We then hope to lure the Japanese companies to subscribe the wireless broadband Internet to subsidize high cost of satellite transponder of CampusNet, so that secondary and primary schools in Amazon region can have the so-called E-Rate access to broadband Internet. Their deployment will utilize a community development approach with the involvements of all non- and profit-organizations to have global E-Rate. This is to follow the model of St. Thomas Island in the Caribbean.

Joint Programs and Projects.

During the Manaus workshop, Brazilians, Americans and Canadians will discuss and plan on how to utilize the expected broadband Internet for possible joint contents development, e-learning and e-healthcare (including health education on nursing and public health, etc.) programs and projects, teacher and general-public training for digital literacy, English as a Second Language (ESL), nurse training, etc. This workshop will also initiate US/Brazilian joint research and development projects. These joint projects will promote the use of information and communication technologies (ICT) for economic and social development with special emphasis on the poverty and isolation reductions in Amazon region. The purposes are;

- To form US-Brasilian joint teams for each of the programs and projects.
- To conduct their global e-learning and e-healthcare with the appropriate members of the CampusNet affiliated universities through their existing telecom infrastructures.
- To encourage each of the teams applying further funding for their own continuing activities, if necessary.
- To have each of the teams design content development and its associated budgets when broadband Internet will be available in the future. Their budget will be included in the comprehensive document for applying the Japanese ODA fund.

Deployment of broadband Internet requires huge initial investment for satellite earth stations and high costs of recurring satellite transponders. The former may be covered by, say, the Japanese ODA fund. However, though the initial phase cost of the latter may be made by the fund, it would not usually last long and has to be incurred by local users after the initial phase is over. Namely, the use of the broadband Internet has to have enough marketability for sustainable use. In other words, the deployment of broadband Internet has to go hand-in-hand with contents development, like the two wheels of a cart, for the effective use of, particularly, the satellite transponders. When we will then submit our application to the ODA fund, we will indicate how effectively the line will be utilized with the well-prepared and organized e-learning content. We thus hope to avoid the recent failures of global broadband Internet telecom carriers.

Financing with Japanese ODA Fund.

We plan to deploy the CampusNet and the Community Development Networks (which total estimated amount could be in the range of US\$15 to 20 million) with the Japanese government's ODA funds; e.g., Japan Trust Fund for Consultancy Services (JCF) of the Inter-American Development Bank (IADB), Japan Social Development Fund of the World Bank, or "Non-tied cultural aid grant" out of the ODA fund of the Japanese Ministry of Foreign Affairs (MOFA).

This is also to follow the models made by Uruguay and Ukraine people who have already received about US\$750,000 each from the Japanese government's fund; the former received through the IADB for their preparatory works to subsequently receive multimillion dollars for the implementations of their broadband Internet in K-12 schools and the latter received through the World Bank for their major education reform.

This is to follow the model of the University of South Pacific in Fiji, which connected nearby islands with narrow-band Internet satellite with US\$13 million (and additional \$3 million later) from the Japanese, \$1 million each from the New Zealand and Australian governments, respectively. Incidentally, the Brazilian government has already pledged US\$2.8 million for the total estimated cost of US\$10 million of the MRCs of the CampusNet. Brazilian Air Force's SIPAM (former SIVAM) Program has already started implementing a part of the CampusNet in Benjamin Constant (border with Colombia), Eirunepe (border with Bolivia), Parintins (Easter Amazonas State) and Coari (Central Amazonas State). The university hospital in Manaus is also heavily involved in this project.

Author Ustumi helped the Japanese government pledge US\$15 billion to close the digital divide in developing countries during the Okinawa Summit in July of 2000. Mr. Koizumi, Prime Minister of Japan, made another pledge of US\$2 billion to aid education and healthcare in developing countries during the G8 Summit in Canada in June of 2002, and at the Environment Summit in Johannesburg, South Africa in September of 2002, respectively.

Our projects will combine (1) the Japanese government's ODA funds and (2) Japanese electronic equipment (computers, transceivers, dish antennas, etc.) with (a) the Internet technology and (b) content development of North America, to help underserved people in rural and remote areas of developing countries by closing the digital divide.

GUS will emulate the above mentioned project schemes in other developing countries around the world (e.g., Cuba and the Caribbean region, Malawi in Africa, - both are already on-going - and Venezuela, South Asian and Eastern European countries, etc. in the near future).

GLH in Tampere, Finland.

The 1999 GLH was conducted during our workshop/conference at the University of Tampere in Finland (see below) with:

- 1. Point-to-point NetMeeting videoconferencing via broadband Internet with Montana State University,**
- 2. Telemedicine demonstration with echocardiogram through ISDN line at 384 Kbps with Presbyterian Hospital of Columbia University in New York.**

Both were very satisfactory from the standpoint of e-learning as well as medical diagnosis.

With the support of generous funds from the Ministry of Education Finland, the United States National Science Foundation (NSF), the Information for Development Program (infoDev) administered by the World Bank, and many others, GLOSAS and the University of Tampere conducted a highly successful International Workshop and Conference on "[Emerging Global Electronic Distance Learning \(EGEDL'99\)](#)" in August, 1999 at the University of Tampere, Finland.

About 60 decision-makers and leaders in e-learning and telemedicine from 14 underserved countries brainstormed, and the workshop recommended the formation of the Global University System (GUS)[™] with Global Broadband Internet (GBI).

The group also formulated specific pilot projects to reduce the growing digital divide between information-rich and information-poor populations, in order to realize "education and healthcare for all," anywhere, anytime and at any pace.

The Tampere workshop mentioned above was a study in contrasts, and clearly showed the enormous gap between the "haves" and the "have-nots." A major challenge will be to identify technology that will be appropriate (in terms of start-up and operating costs, sustainability by local people, etc.) in the "have-not" situations.

Thanks to our highly successful event in Tampere, Finland, substantial momentum for our global initiative is now building up to have follow-up workshops and conferences to forge ahead in the establishment of the GUS with GBI by multilateral collaboration.

Current Activities

Some infrastructure is currently being put in place now, with the aid of grants and support from hub universities. We are pursuing funding from the various governments and UN agencies. Collaborative arrangements might be made with telecommunications companies, which of course have a vested interest in bringing the Internet to all parts of the globe. There are barriers to creation of GUS (political, economic, technical, geographical, etc.), but we find that our core partner universities have a great deal of experience in coping with the problems in their regions.

Several major collaborative development projects are currently under way. These include:

- 1. Amazon - with the University of Amazona and 5 other federal universities in Amazon region,**
- 2. Cuba and the Caribbean - with Havana Institute of Technology and the University of Havana,**
- 3. West Indies (Barbados, Trinidad, and Jamaica) - with the University of West Indies,**
- 4. Malawi - with the University of Malawai, UNDP, UNIDO, University of Milan,**
- 5. Uganda - with the Islamic University of Uganda and the National Council of Science and Technology,**
- 6. Yugoslavia - with the Mathematical Institute of Serbian Academy of Sciences and Arts in Belgrade, Yugoslavia and University of Macedonia and Thessaloniki Higher Technological Educational Institute in Greece, etc.**

As for the practical matters of specifying academic programs and developing administration plans, discussions of the many options are now under way.

Solicitation of Ideas, Resources, Partnerships

Clearly, GUS is an ambitious program, one that cannot be achieved by any one group, university, or national government. The program will need substantial collaborative contribution of ideas, expertise, technology resources, and money from multiple sources. We invite those who value the vision of GUS to join us in this great, noble enterprise.

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Author Biographical Sketches

Takeshi Utsumi, Ph.D., P.E.

Founder and Vice President for Technology & Coordination

Global University System (GUS)

Chairman, GLObal Systems Analysis and Simulation Association in the U.S.A.

(GLOSAS/USA)

43-23 Colden Street

Flushing, NY 11355-3998 U.S.A.

Tel: +1-718-939-0928;

Fax: +1-718-939-0656

utsumi@columbia.edu

<http://www.friends-partners.org/GLOSAS/>



Takeshi Utsumi, Ph.D., P.E., is Chairman of GLObal Systems Analysis and Simulation Association in the USA (GLOSAS/USA) and Vice President for Technology and Coordination of the Global University System (GUS) <<http://www.friends-partners.org/GLOSAS/>>. He is the 1994 Laureate of the Lord Perry Award for Excellence in Distance Education. His public services have included political work for deregulation of global telecommunications and the use of e-mail through ARPANET, Telenet and Internet; helping extend American university courses to developing countries; the conduct of innovative distance teaching trials with "Global Lecture Hall" multipoint-to-multipoint multimedia interactive videoconferences using hybrid technologies; as well as lectures, consultation, and research in process control, management science, systems science and engineering at the University of Michigan, the University of Pennsylvania, M.I.T. and many other universities, governmental agencies, and large firms in Japan and other countries. Among more than 150 related scientific papers and books are presentations to the Summer Computer Simulation Conferences (which he created and named) and the Society for Computer Simulation International. He is a member of various scientific and professional groups, including the Chemists Club (New York, NY); Columbia University Seminar on Computer, Man and Society (New York, NY); Fulbright Association (Washington, D.C.); International Center for Integrative Studies (ICIS) (New York, NY); and Society of Satellite Professionals International (Washington, D.C.). Dr. Utsumi received his Ph.D. Ch.E. from Polytechnic University in New York, M.S.Ch.E. from Montana State University, after study at the University of Nebraska on a Fulbright scholarship. His professional experiences in simulation and optimization of petrochemical and refinery processes were at Mitsubishi Research Institute, Tokyo; Stone & Webster Engineering Corp., Boston; Mobil Oil Corporation and Shell Chemical Company, New York; and Asahi Chemical Industries, Inc., Tokyo.

P. Tapio Varis, Ph.D.

Acting President, Global University System
UNESCO Chair in global eLearning with
applications to multiple domains
Professor and Chair of Media Education
University of Tampere
P.O.Box 229
FIN-13101 Hameenlinna, Finland
Tel: +358-3-614-5608;
Fax: +358-3-614-5611
tapio.varis@uta.fi
<http://www.uta.fi/~titava>



Tapio Varis, Ph.D., is currently Professor and Chair of Media Education, earlier Media Culture and Communication Education at the University of Tampere, Finland (Research Centre for Vocational Education, and Hypermedia Laboratory), and UNESCO Chair in global e-Learning with applications to multiple domains. He is Acting President of the Global University System (GUS). Formerly he was Rector of the University for Peace in Costa Rica, and Professor of Media Studies at the University of Lapland, Finland. He has been a consultant on new learning technologies for the Finnish Ministry of Education, and expert on media and digital literacy for the EC, Council of Europe, Nordic Research Councils, and many Finnish and foreign universities. He is a member of the European Union's PROMETEUS Steering Committee and Adviser to several international organizations. In 1996-97, he was UNESCO Chair of Communication Studies at the Universitat Autònoma de Barcelona, Spain. He has also been a faculty member of the European Peace University (Austria), Communication and Media Scholar at the University of Helsinki and at the University of Art and Design in Helsinki. He has published approximately 200 scientific contributions which are listed at his Website: <<http://www.uta.fi/~titava/publications00.html>> with additional biographical information (in Finnish). In 2001 he received The Rochester Intercultural Conferences 1995-2001 award as "an outstanding European scholar in intercultural and international communication." In addition to Finnish, he is fluent in English, Spanish, German, and Swedish.

W. R. (Bill) Klemm, D.V.M., Ph.D.

Professor of Neuroscience

Texas A&M University, Mail Stop 4458

College Station, TX 77843-4458, U.S.A.

wklemm@cvm.tamu.edu

<http://www.cvm.tamu.edu/wklemm/>



Bill Klemm's scientific interests include such areas as brainstem mechanisms of behavior, membrane and cell-level mechanisms of alcohol, learning/memory, chemical signals, human cognition, and EEG. See his [list of about 400 publications](#) (including 9 books and 45 book chapters). His work as an educator includes teaching upper-division undergraduate courses in [Introductory Neuroscience](#) and [Science & Technology: Practices, Policies, and Politics](#). He has also created a web site "[Publications on On-line Collaboration and Educational Technology](#)" of his publications dealing with collaborative learning and distance education. He is co-developer of a Web-like computer conferencing and publishing system, called [FORUM Matrix](#). He also co-developed the computerized self-quizzing game, called Get Smart! His honors include serving on the Board of Editors of seven journals: *The Technology Source* (1998 to present), *Progress in Neuropsychopharmacology & Biological Psychiatry* (1988 to present); *Archives Clinical Neuropsychology* (1992 to present); *American Journal of Veterinary Research* (1995-1999), *Psychopharmacology* (1980-1985); *Journal of Electrophysiological Techniques* (1978-87); *Communications in Behavioral Biology* (now *Behavioral & Neural Biology*) (1970-1973). He has been selected as an *ad hoc* Reviewer for 34 scholarly journals, 8 book publishers, and several government agencies (NSF, NIH, USDA). He has listed in some 17 Biographies and has Distinguished Researcher awards from Texas A&M and Sigma Xi, Texas A&M. He served on the international Board of Directors of the 70,000-member Sigma Xi, The Scientific Research Society. A more complete resume is available [here](#).