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AUTHOR Carty, Winthrop
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ABSTRACT

This paper analyzes the broad context and covers practical applications for delivering distance education in countries of the developing world. It begins by examining market trends in global higher education and continues by reviewing existing distance education activity in developing countries. This is followed by a discussion of the conditions--from the pedagogical to the technological--under which United States universities can conduct international distance education in that part of the world. Finally, the report concludes with recommended strategies for engaging people and institutions on behalf of mutually beneficial distance education programs that target or include developing countries. Most strategy options share a common philosophy: be flexible, respect local ways of conducting education, seek an appropriate middle ground where fundamental differences exist, and work to ensure that the flow of learning is two-way; simply exporting the "American way" is neither sustainable nor appropriate. Ultimately, each U.S. university needs to provide its own answer as to why it would choose to engage in distance education in developing countries. A table of mega universities around the world indicating unit costs and a table showing global disparities in telecommunications and computing are appended. (Contains 10 references.) (AEF)

New Markets for Meeting Old Needs: U.S. Distance Education and Developing Countries

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Winthrop Carty
Senior Development Officer
for New Programs and Technology Initiatives
LASPAU
25 Mt. Auburn Street
Cambridge, MA 02138 USA
http://www.laspau.harvard.edu
email: winthrop_carty@harvard.edu

Abstract

This paper analyzes the broad context and covers practical applications for delivering distance education in countries of the developing world. We begin by examining market trends in global higher education and continue by reviewing existing distance-education activity in developing countries. This is followed by a discussion of the conditions -- from the pedagogical to the technological-- under which U.S. universities can conduct international distance education in that part of the world. Finally, this report concludes with recommended strategies for engaging people and institutions on behalf of mutually beneficial distance education programs that target or include developing countries.

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INTRODUCTION

Over the next two decades the developing world will face unprecedented demand for quality higher education. U.S. universities are in an unique position to help address these challenges and at the same time shore up enrollments and further internationalize their own institutions. In sum, we are now witnessing a convergence of interests between the U.S. university community and the educational needs of students in developing countries.

The conduit for this convergence of needs and interests is distance education.

This paper analyzes the broad context and covers practical applications for delivering distance education in countries of the developing world. We begin by examining market trends in global higher education and continue by reviewing distance-education activity in developing countries. This is followed by a discussion of the conditions -- from the pedagogical to the technological-- under which international distance education can be conducted in that part of the world. Finally, this report concludes with recommended strategies for engaging people and institutions on behalf of mutually beneficial distance education programs that target or include developing countries.

The paper is primarily directed at a U.S.-university audience. While many of the issues are fairly generic -- that is, they would resonate equally with the experiences of other industrialized-country universities operating in developing countries-- others are not. By concentrating on the United States' fairly unique higher education structure, curriculum, and approach to distance learning, I intend to lend the paper focus.

Conversely, while the paper focuses on the relationship of the United States to the "developing world", it often generalizes -- again for the purpose of focus-- the context and educational systems of developing countries. Generally accepted labels of "developing countries" actually encompass the very poor (such as most of sub-Saharan Africa), poor (such as much of Latin America) and middle-income nations (like Argentina). Also, cultural traditions drive several of the conditions one faces in implementing international distance education and, as we know, the world is a culturally diverse place.

In sum, this paper acknowledges that global distance education is, and must continue to be, a dynamic and heterogeneous system.

II. CONTEXT

Linking Quality Higher Education to Economic Development

Governments, private institutions, and families in many developing countries have longstanding traditions of turning to U.S. universities for training, technology transfer, and enhanced job opportunities. The Asian Tigers' industrialization was fueled in large part by its export of students abroad, including to the United States, as a means of rapid technology transfer. Today, despite the Asian economic crisis, Asians still represent 58% of the nearly half million foreign students hosted by U.S. universities. [1]

The Asian lesson has not been lost on the rest of the world: multi-lateral agencies, governments, and individuals alike view foreign training, especially in European and U.S. universities, as key to their future economic success. This link between education and development is becoming even more dramatic as understanding sinks in that the world has shifted to a new economic paradigm: the so-called global knowledge economy. In most of the developing world, globalization, economic liberalization, and the information revolution is forcing new skills requirements on previously protected labor markets.

Higher Education Population Explosion

The sheer number of students seeking meaningful university training will explode over the next twenty years. Under current systems and budgets, this need can't possibly be met, locally or abroad. Today, people in developing countries are disproportionately young (with about half of all people yet to reach adulthood). This disproportionate age distribution coincides with a second problem: recent investments and reform in basic education have dramatically improved the percentage of children enrolled in primary and secondary school in developing countries. This, in turn, will prompt a "domino effect" in education: a virtual explosion of demand for tertiary education by a higher-than-ever percentage of first-generation high-school graduates. In Latin America, for example, the rapid expansion in the number of new private universities (generally of poor quality) represents the initial symptoms of this phenomenon.

The vast majority of developing countries and their universities are completely unprepared to accommodate the growth in student numbers and increased expectations they bring regarding access to relevant, quality higher education. Public funding of higher education has stagnated and in most cases decreased, and the institutions themselves often suffer from brain drain, politicization, and excessive regulation and bureaucracy. Hence, today members of developing societies are looking abroad more than ever before.

Distance Education: Helping to Address the Quality versus Quantity Concern

Based on the discussion above, we can say that developing countries are faced with a "quality-versus-quantity" dilemma. If quality higher education is indispensable to survival in the globalized knowledge economy, how will they possibly be able to provide it:

a. where it doesn't now exist?
b. to vastly more people?
c. with roughly the same level of resources?

Regardless of the public sector's response, where do individuals turn to in the private sector -- which currently is absorbing the spillovers in demand, usually at the expense of quality-- for post-secondary education?

Answers to these questions will increasingly be sought through distance education emanating from or in

partnership with industrialized-country universities. U.S. universities will invariably play a prominent role in this process.

The initial reasons distance education will be interpreted as a solution to the quality-versus-quantity dilemma are mostly economic:

1. **Technology becomes more accessible and more affordable.** As computer-processing speed-to-cost ratios continue to double every 18 months[2] and telecommunications costs plummet while bandwidth capabilities soar in similar ratio, it will become vastly cheaper and easier to reach geographically wide student audiences. This eventually will be true even in neglected regions with the arrival of wireless systems. For the first time in history, basic access to communications will not be a significant barrier and many will want to seize this opportunity.

2. **Economies of Scale.** The other motivating factor for choosing distance education is the economies of scale enabled by technology-driven distance education. According to this argument, many distance education delivery technologies can afford to have high fixed costs (such as course production costs or satellite transmission) and access to the best and brightest educators because they can spread these costs across vastly larger student populations. Hence, the per unit cost of education can then, in theory, be dramatically lowered through high student numbers -- precisely what developing countries will have in abundance.

To summarize, distance education will increasingly be viewed as the means to provide *more people* with *better education* using the same resources. The jury is still out on whether this argument will hold up over time, but U.S. universities will nonetheless have ample opportunity to participate in efforts to ensure it does.

Review of Current Activity

A survey of distance education in developing countries reveals a rich diversity of activity over many years -- within single countries, across regions, between continents. Predating the current technological revolution, the UK Open University is perhaps the best known of the "mega universities", having granted over a quarter million degrees since 1971. The UK Open University is a good example of university training based in the industrialized world that increasingly reaches out to students in developing countries. The university has also been remarkable in its success in reengineering its traditional print-based open learning system to one also encompassing the full spectrum of delivery media while also adapting the mix to meet local demands on a global scale. In 1996, UKOU established Open University Worldwide (OUWO). Current overseas enrollments exceed 20,000, and this number is growing.[3] Many of the traditional mega universities are based in developing countries. For example, China TV University currently graduates over 40,000 students in technology fields. The chart, Mega Universities around the Word" (Table 1 in Appendices) illustrates the reach traditional "mega universities" have enjoyed in the developing world.

Under the new technology paradigm, however, new players have emerged. Two merit special attention for their adoption of new technologies and for having accessed U.S. higher education resources: The African Virtual University, funded by the World Bank, and implemented in collaboration with local universities, is an example of what the public sector can accomplish in sub-Saharan Africa, perhaps the world's most improbable venue for technology-based regional distance education. Monterrey Institute of Technology (ITESM) is illustrative of success achieved through reaching out to the private student market across Spanish-speaking Latin America.

Exemplar 1: African Virtual University

The World-Bank sponsored African Virtual University (AVU) was created to provide large-scale, quality tertiary education in science and technology fields in sub-Saharan Africa where, according to AVU, "the investment cost is the highest and the human resource base is the weakest."

Through partnerships with 14 English- and eight French-speaking universities in 16 countries, AVU aims to augment and supplement local offerings with world-class teaching and research support from industrialized-country universities, including from the United States. Currently into its first full pilot year of operation, AVU has already taught over 9,000 students using interactive satellite instruction supported by online bibliographic resources. The next phase contemplated for the project involves adding online courses to the mix of foreign-source satellite and traditional classroom offerings.

As partner-institution participation increases, the institutions themselves are able to share in the cost-reductions achieved by the improving economies of scale -- a strong incentive for inter-institutional collaboration toward shared academic and socio-economic goals.

For more information about the African Virtual University, visit their website at: http://www.avu.org

Exemplar 2: ITESM

The "Monterrey Tech System" is one of Latin America's top universities and, with over 60,000 students, the largest private institution in Latin America.

ITESM initiated its Virtual University ten years ago, well ahead of the fashion, and hasn't stopped innovating since. The university, based in Monterrey, Mexico, now delivers courses via traditional and distance methods to its 28 regional campuses throughout Mexico and, more recently, has expanded to nine other countries in the Region. The Virtual University's delivery mix includes one-way satellite fortified by realtime Internet-based communications between faculty and remote classrooms, as well as asynchronous interactions through the web between students and faculty, and students and learning materials. Currently, ITESM's Virtual University has 1,429 receiving sites distributed throughout Mexico (1,302) and Spanish-speaking Latin America (127).

Monterrey Tech's Virtual University currently offers 15 different degree programs in business administration, engineering, technology, and education. The V.U. is also expanding into non-degree in-service basic education training programs, which have already trained 750 public school principals in Panama and 5,300 teachers in seven countries across the region.

Monterrey Tech has leveraged its academic quality and expanding distance-education student populations to achieve substantive partnerships with several North American universities. ITESM and the Arizona-based Thunderbird School of International Management currently have 129 Latin American students enrolled in a joint MBA program, the first joint degree between a Mexican and a U.S. university. Students, currently located in Perú and throughout Mexico, are taught via one-way satellite and the web with instruction originating from faculty in both Arizona and Monterrey. ITESM also offers a joint certificate program in educational technology with a Canadian university, the University of British Columbia (U.B.C.), and has collaborated in team teaching, guest-lecture, and other endeavors with a number of U.S. universities, among them Carnegie Mellon, Harvard, and UT-Austin.

For more information about ITESM, visit: http://www.itesm.mx

III. CONDITIONS FOR DELIVERING DISTANCE EDUCATION IN DEVELOPING COUNTRIES

The previous sections attempt to establish that both the market and justification for globalized distance education directed at developing countries have emerged and will increase substantially over the next two decades. Nevertheless, U.S. universities engaged in delivering distance education programs first must understand the conditions -- social, economic, technological, and educational-- prevalent in much of the developing world. The remainder of this paper will endeavor to analyze these conditions -- many of them posing considerable challenge-- and concludes with strategies for managing them.

In many developing countries, the poor quality of telecommunications infrastructure, low per capita

computer ownership, limited technology and information literacy, and restricted numbers of networked institutions together conspire to smother access to the types of online education coming out of the United States and elsewhere. Furthermore, disparities in *fundamental* expectations about what makes up education and what it should cost often need to be surmounted as does, for degree-seeking students, local recognition of degrees.

Some of the "cons" of bridging U.S. and developing-country systems can be interpreted as an exacerbated version of the same issues of access and equity found in the industrialized countries. (For example, a 1999 report by the U.S. Government, "Falling Through the Net: Defining the Digital Divide," pinpoints, in a U.S. context, many of the same concerns discussed in this paper.) However, other issues are unique to individual regions, cultures, or the developing world as a whole.

We will begin with the aspects generally most overlooked -- the human concerns-- and move on from there to the technology and institutional arenas.

Academic Arena

Globalized distance education presents a *huge* challenge: how to bring together highly heterogeneous student populations under one academic roof. Until now, one traveled to Rome and "did as the Romans did." Now, however, where's Rome?

1. **Pedagogy and communication:** Bridging differing approaches to learning and communications is an enormous task. In much of the developing world, rote learning is even more entrenched than it (still) is in the United States. Many developing-country educational systems have highly vertical structures. In Latin America, for example, education is one of the last bastions of traditional authoritarianism in which information is dictated, literally, to students by professors with little interaction, autonomous research or writing. These patterns have engendered strong resistance to the new learning styles promoted by the more horizontal, student-centered approaches emerging in distance education.

2. **Curriculum:** U.S. universities, especially at the undergraduate level, offer a considerable amount of freedom of choice and breadth of subject matter through electives, general education, electing or changing majors downstream, adding minors, and so forth. In many countries, coursework outside of one's "career" is viewed as near heresy. One can imagine, then, the skepticism encountered with U.S. exports and the unbundling and rebundling of course offerings that technology now evokes. This disparity is a challenge well beyond the mere mechanics of assembling degree programs and extends to people's core definition of education.

3. **Faculty:** The highly ambivalent reaction of faculty to the new paradigm being rendered by technology is universal. Early-adopter enthusiasm and experimentation, countered by others who are skeptical and resistant, is found everywhere these new systems are introduced. However, it is safe to say that, overall, in developing-country universities, given much lower technology penetration the extremes are more marked, with more people in the ambivalent or unknowing middle, yet to be impacted by the change. On the one hand, enthusiasm among some is intensified by the huge benefit teachers and researchers in poor countries perceive, correctly, in discovering new international colleagues and vastly more up-to-date research. In other words, the improvement to their professional lives through connectivity is far greater in relative terms than to, say, a professor at Columbia University in New York who already had access to state-of-the-art teaching and libraries along with international networks of colleagues. The backlash, or often just passive resistance, is also more entrenched in most developing-country universities. A very high proportion of faculty in much of the developing world has failed to become technology and information literate, and many of these people interpret sudden access by colleagues and students to represent, correctly, a threat to their monopoly on a limited amount of outdated information.

4. **Students:** Generally, one encounters larger portions of university students with little or no level of "technology literacy" (defined here as ability to use Information Tecnology and to learn, with comparative ease, new software and systems). In practical terms, this translates into far steeper

learning curves in some countries and institutions than in others when introducing technology-based distance education programming. Socio-economic backgrounds are an important determinant, with members of local elites generally as conformable with technology as mainstream U.S. students, while the non-elite majorities can be completely unfamiliar with computers. Perhaps more important are disparities in "information literacy"[4] -- in which information is collected, usually through computer networks, then, through active collaboration with others, used to construct new understanding. A generation of U.S. (and other industrialized-country) university students already have become semi- or fully "information literate" while most developing-country university students are still struggling with basic technology literacy. Many believe this disparity is growing, which has significant implications for both the practical aspect of global distance education (i.e., functioning under one "academic roof") as well as for the overall socio-economic issues.

5. **Materials:** Much is made, correctly, about the burgeoning availability of resources online. However, books and hardcopy journals and other bibliographic materials are still important even in many distance education programs. Ready local access to these materials cannot be assumed and their distribution around the globe is no trivial task. Even if no hardcopy materials are needed for a program or their distribution is addressed from a logistical standpoint, students in many countries with severe shortfalls in libraries and bookstores are at a distinct disadvantage when it comes to supplemental reading and research.

6. **Accreditation and assessment issues**: In historical terms, this can of worms has only just been opened and it promises to be very complicated. Accreditation bodies throughout the world, whether they be education ministries or, in the United States, private agencies, are becoming overwhelmed. New standards of measurements are only beginning to be developed in the United States for programs devoid of the bricks-and-mortar campus. The emergence of digital diploma mills, using the aura of technology to peddle their wares, poses a significant problem to the majority of quality-conscious efforts. Developing countries, often with legacies of highly credentialistic civil service systems left behind by colonial powers, are especially vulnerable to promises of quick "American degrees" for public-sector jobs. These activities are often marketed unscrupulously in developing countries. Unfortunately, this phenomenon has fueled the skepticism over the increased flexibility, dynamism, and access distance education *can* provide people who need it. It is important, therefore, for U.S. universities to portray -- more than they would need to locally-- their accreditation credentials and assessment processes.

Cultural Arena

The diversity rendered by international distance education adds a new and extremely valuable dimension to the learning experience. Students in multi-point distance education programs typically highlight cross-cultural interaction as one of the best features of the experience. Bridging cultures is also a big challenge. As mentioned earlier, communication patterns, values regarding one's elders, and the social status of "the professor" can vary widely. For example, in their study of international distance education, Michigan State researchers Inkyung Lee and Joonho Do note that different oral communication styles between Koreans and Americans represent a significant challenge to ensuring student motivation and averting misunderstanding between faculty and student groups. Asynchronous technologies have been found to be an excellent "equalizer" across differing communication styles and language proficiency levels. Students who are shy or less proficient in the language of instruction than other, possibly native, speakers, have time to compose, double check, and prepare their contribution. On the other hand, other cultures, such as many of those in Latin America, emphasize oral communication more greatly and give less credence to written communications than to face-to-face interchange, making heavy reliance on asynchronous communications a possible barrier to positive learning outcomes.

Technology Arena

In discussions about distance education in the developing world, the technology issues typically grab the spotlight. There are huge disparities in access to computing and communication resources as the table, "Global Disparities in Telecommunications and Computing," located under Table 2 in Appendices,

starkly indicates.

These "information gaps" are especially dramatic in some regions of the developing world, such as sub-Saharan Africa and in virtually all rural and provincial areas. In addition, even where access to adequate telecommunications exists on paper, their cost or the delays in installing them can be severe impediments. Currently, for example, the high rates of local telephone connections in Buenos Aires make lengthy browsing or videoclip viewing through a local Internet service provider, taken for granted in the U.S., a costly activity. Few institutions are properly networked, hardware is often old, and typically there is a paucity of trained technical support to keep systems running.

Thus, as a rule, bandwidth, and access to local and wide area networks is a scarcer and sometimes non-existent commodity, a factor that must be taken into account in determining the mix of delivery technologies. Historically, distance education efforts have taken to the airwaves to circumvent these problems and, indeed, as the cases of ITESM and African Virtual University illustrate, they continue to do so.

Two factors will help offset these "technology barriers," which is why I believe more attention should be paid to the human, cultural, and educational concerns than to the purely technological problems:

1. **The exponential rate of improvement to the ratio of cost to computing speed is quickly lowering the threshold for participation by poorer countries in technology-based education.** This will not apply to the speed of penetration of the newest technologies, which will continue to "trickle down." However, dropping thresholds to entry help speed up attaining the critical masses of connected people and institutions needed to justify distance education.

2. **The wireless revolution, now in its incipient stages, will circumvent the traditional barriers to telecommunications connectivity.** This impact will be especially dramatic in the poorest and most rural areas.

In sum, devices will be able to be connected to each other and to the outside world more efficiently and at costs that will eventually drop to realistic per capita spending levels in the developing world. It is important to note, however, that shifting these resources to these new venues from often wasteful and entrenched education bureaucracies is another -- non-technology-- matter.

Political and Economic Arena

Unstable politics, volatile economies, and weak institutions have plagued developing societies throughout most of their histories. Collaborative international distance education, with its need for planning across systems and over time, is especially vulnerable to these elements. For example, when the value of the Brazilian *real* collapses relative to the U.S. dollar, tuition costs for U.S. university programs skyrocket. While rich Brazilians can absorb this increase, the larger and more fragile middle class often cannot and drops out. In another scenario, a change in government in a country with a "winner-takes-all" approach to public office could result in a radical shift in accreditation of distance education degrees or a rescinding, perhaps whimsically, of a joint program arranged with the support of the previous Education Ministry.

These problems are indeed real and need to be factored into one's "risk analysis" when engaging in new activities in new countries. The best advice is to start gradually, build on existing relationships, ensure working with local partner institutions, and stay on top of ongoing political trends. On the positive side, the numbers of stakeholders in distance education will invariably grow among members of local governments, institutions, and civil society, which should lend greater stability and predictability to the endeavor.

Funding of higher education and local attitudes toward the perceived cost of education is another factor. In many places, university education, in stark contrast to U.S. attitudes, is expected to be "free," as real costs are absorbed through state subsidy. Private universities have stepped in, often with low tuition levels and commensurately low academic quality, further fueling the notion that, somehow, "education

is cheap." In this context, the disparities between U.S. tuition levels and those in many countries can be huge. And even when many private citizens can afford to pay these tuitions, they perceive the costs as exorbitant, especially if the education is delivered through poorly understood systems and methodology. This disparity in expectations may change over time as higher education reform in many countries attempts to address more transparent funding systems and issues of academic quality. Also, many believe that U.S. higher education is economically inefficient and over-costly and will invariably be brought to its budgetary knees through competition from the new academic interlopers (many of whom are in distance education).

IV. STRATEGIES

We have just reviewed the conditions for delivering distance education in developing countries. The following set of strategic issues includes general recommendations for how to navigate through these conditions, if and when they in fact exist.

Strategic Issue 1: Modalities

How will your university work in specific countries or regions?

- **Build on existing international partnerships wherever possible. If the local capacity exists in terms of technology and change, tried and true relationships, which already enjoy trust and personal connections, are the best option.**
- **Seek out new local partner institutions. Invest time to start gradually.**
- **Grants, public programs: Increasingly, multi-lateral organizations (such as the World Bank) are funding distance education initiatives. Local, in-country partners are usually a pre-requisite for funding.**
- **Direct private enrollment. The online degree model circumvents the need for local partners. Marketing is a big challenge.**

Strategic Issue 2: Academic Concerns

How do you ensure accreditation and explicit standards?

- **Academic program accreditation is fundamental and must be made explicit for credibility.**
- **Student admissions and enrollment systems need to adapt to local context while clearly upholding international quality standards.**
- **Student evaluation and grading systems must be consistent across groups; ensure control for fraud and abuse (surrogate test-takers, etc.).**

Strategic Issue 3: Pedagogical Concerns

How to reconcile assessment processes, and teaching and learning styles?

- **Invest in coordination, planning, and, especially, training local faculty and staff.**
- **Ensure more-than-adequate training and support for students to ensure high comfort levels.**
- **Evaluate, *a priori*, different learning traditions and approaches and have a clear pedagogical strategy for reconciling differences among heterogeneous groups.**
- **Ensure no significant disparities in access to learning materials, or structure coursework to ameliorate them.**

Strategic Issue 4: Technologies

Which delivery media mix? How to predict changes in local access or capacity relative to the United States?

- **Scale communications and software to shared levels. Ensure no student group is excluded by the choice of technology.**
- **Invest in developing local, in-house capacity to support and train in new and upcoming technologies.**
- **Be especially flexible in your mix of media. Build into course design the ability to substitute one system with another in event of failures or miscalculations of local capacity (for example, sending video cassettes en lieu of videostreaming).**

Most strategy options share a common philosophy: be flexible, respect local ways of conducting education, seek an appropriate middle ground where fundamental differences exist, and work to ensure the flow of learning is two-way; simply exporting the "American way" is neither sustainable nor appropriate. These strategies have little to do with modern technology and, instead, represent traditional common sense.

V. CONCLUSION

The paper argues that we have arrived at a convergence of interests between the U.S. university community and the educational needs of students in developing countries: international distance education will increasingly be a means for U.S. universities to expand their reach, while potentially millions of students, previously locked out of the quality higher education arena, will now be able to enter. First, however, many complex and changing challenges need to be tackled, ranging from rationalizing highly heterogeneous educational systems and socio-economic levels, to bridging disparities in technology. But, as we know from the exemplars of ITESM and AVU, these challenges can be surmounted. Furthermore, despite the gaping "technology gaps" between rich and poor, the price for accessing the technologies will reach negligible levels and the impending wireless revolution will obviate the need for depending on governments for costly infrastructure to connect.

Ultimately, each U.S. university needs to provide its own answer to why it would choose to engage in distance education in developing countries. The paper provides one reason, which should be common to all institutions: the student market exists and will grow.

However, there are other reasons of greater transcendence to most U.S. universities, public and private. First, by engaging themselves in distance higher education in the developing world, U.S. universities will be themselves better equipped for the globalized future; as the global economy becomes more interdependent, so will higher education. Are U.S. universities prepared for this interdependence? Already, in response to this challenge, many U.S. universities are making explicit efforts to further "internationalize" their campuses. What better way to internationalize than through team-taught classes with multiple sites around the globe engaging student teams across time, distance, culture, and perhaps even language?

A final, though no less important reason, is the contribution U.S. higher education can make to global society. We are at the beginning stages of the Information Revolution and can only speculate what the world's landscape will look like once the dust settles. U.S. universities have an opportunity to influence the outcome. They also face the risk of being left behind.

APPENDICES

Table 1: Mega Universities around the World

Mega Universities Around the World				
Institution	**Began**	**Students**	**Budget (US$-M)**	**Unit Cost**
Anadolu University, Turkey	1982	578,000	30	10%
China TV University	1979	530,000	1	40%
Universitas Terbuka, Indonesia	1984	353,000	21	15%
Indira Gandhi National Open University, India	1985	242,000	10	35%
Sukhothai Thammathirat Open University, Thailand	1978	217,000	46	30
Korean National Open University	1982	211,000	79	5%*
National Center for Distance Learning, France	1939	185,000	56	50%
The Open University, Britain	1969	157,000	300	50%
University of South Africa	1873	130,000	128	50%
Payame Noor University, Iran	1987	117,000	13	25%
National Center for Distance Learning, Spain	1972	110,000	129	40%
**Cost per student as a percentage of average for other universities in Korea*				
Data Source: John Daniel, Mega-Universities and Knowledge Media. **Also published in Science magazine July 18, 1997**				

Table 2: Global Disparities in Telecommunications and Computing

Global Disparities in Telecommunications and Computing			
Country Classification	**Telephone Main Lines per 1,000 - 1996**	**Personal Computers per 1,000 - 1996**	**Internet Hosts* per 10,000 July 1997**
Low Income	11	not available	0.06
Middle Income	78	12.1	2.38
High Income	540	224	203.46
World	133	50	34.75
* Internet Host is a computer (server) permanently connected to the Internet and serves as a rough measure of overall connectivity			
Data Source: World Development Report, World Bank, 1998/99			

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ENDNOTES

1 Source: Institute of International Education, "Open Doors" 1997/98.

2 Known commonly as "Moore's Law", every 18 months the same processing power costs half as much and, inversely, twice as much processing speed can be purchased for the same amount of money. Over time, this rate of improvement is exponential.

3 "Globalising Education: Trends and Applications," by Robin Mason of Open University, provides insights into UKOU's global experiences along with in-depth coverage of many of the issues discussed in this paper.

4 See Taizo Nishimuro's case for a fundamental difference between computer literacy and information literacy, in "Information Literacy: How does it differ from Traditional or Computer Literacy?" at http://www.TechKnowLogia.org

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Abstract:	This paper analyzes the broad context and covers practical applications for delivering distance education in countries of the developing world. We begin by examining market trends in global higher education and continue by reviewing existing distance-education activity in developing countries. This is followed by a discussion of the conditions -- from the pedagogical to the technological-- under which U.S. universities can conduct international distance education in that part of the world. Finally, this report concludes with recommended strategies for engaging people and institutions on behalf of mutually beneficial distance education programs that target or include developing countries.

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