

THE INTERNATIONAL RICE RESEARCH INSTITUTE'S CURRENT PROGRESS AND FUTURE DIRECTIONS IN THE APPLICATION OF DISTANCE LEARNING TECHNOLOGIES FOR HUMAN CAPITAL DEVELOPMENT IN NATIONAL AGRICULTURAL RESEARCH SYSTEMS

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Introduction

We are currently witnessing a profound paradigm shift in the way professional educators envision the future of education and training.

Computer networking technology requires and enables a whole new way of teaching and learning. For the first time in human history we can have many-to-many communication across time and space. Never before have we been able to have group interaction that's time and space independent (L. Harasim, 1996).

This shift has created a virtual “goldrush” as educational and training institutions have made major efforts to develop their capabilities to apply new information and communication technologies (ICTs) to distance learning efforts. Major trade magazines invariably include an article on the potential of ICTs. Journals and Websites have sprung up dedicated entirely to the reporting of research on various distance learning approaches. Job postings are dominated by requests for educators who are familiar with these technologies and have experience in setting up distance learning programs. Most major corporations are making large investments in the development of in-house Web-based training courses. Books dedicated to this topic have proliferated, and it has become the favorite choice of educational conferences around the world.

The excitement is shared by both academics and corporate trainers. Drucker (in Abernathy, 1998:29) maintains that, “*Thirty years from now the big university campuses will be relics... It's as large a change as when we got the printed book... Already we are beginning to deliver more lectures and classes off-campus via satellite or two-way video at a fraction of the cost*”. Schaaf (1997:A6), from a corporate perspective notes that, “*In recent years, a host of companies large and small has been industriously developing components of a virtual pipeline that is increasingly able to move training material from site to site - or among multiple sites – simply, seamlessly and cost-effectively*”.

Of course there are those who are not convinced of the benefits of this approach. Sinclair (1998:299) states that,

The cash value of ideas and commodification of knowledge that would seem to be a logical consequence of marketing online education is still resisted stoutly by traditional institutes where the penchant for scholasticism and academic independence is rigorously maintained. It is this robust attitude that guards the integrity of our scholastic heritage and it is questionable whether we should be sacrificing this heritage for the largely as yet unproven expediency of online education.

And so the debate continues between educators and trainers scattered along “*the continuum between technozealots and infoluddites*” (Sinclair, 1998:299) with most practitioners somewhere in the middle trying to see their way through the conflicting claims and hype and trying to capture the potential promised. The “*technorealists*” have perhaps the most balanced perspective as they advise that we “*neither champion nor dismiss technology, but rather understand it and apply it in a manner more consistent with basic human values*” (Bennahum, 1998:2). All professional educators must strive to

acquire first hand experience and go through the process of adapting these technologies to particular sets of circumstances, training content, and target audiences. Chute (in Schaaf, 1997:A16) advises us that, “*Given the degree of change involved for both trainers and those they serve, caution is understandable. But there’s also the old axiom that says you can’t learn to swim by sitting on the side of the pool.*” If successful, the result will be educational and training efforts that are more cost effective and that reach our clientele efficiently. As a recent article in Training Magazine (Schaaf, 1997:A8) puts it, “*the Holy Grail is a training delivery system that can provide exactly what’s needed, exactly where it’s needed, exactly when it’s needed, and exactly to whom it’s needed.*”

The International Rice Research Institute (IRRI) is no exception in this search for more effective and efficient delivery of training. It has a tremendous responsibility to “*develop an effective core of rice professionals in national agricultural research systems (NARS) better equipped to create and apply traditional and new approaches to address global rice production and utilization problems*” (IRRI, 1998:98). The Institute wants to take advantage of the potential of the new technologies and make the right decisions that will allow it to best serve its global clients. A recent review of the Consultative Group of International Agricultural Research (CGIAR) system, of which IRRI is a part, has made strong recommendations that IRRI and the other International Agricultural Research Centers (IARCs) accelerate their efforts to apply ICTs to training and information dissemination. The review states that,

New communication and computing technologies will have profound implications in everyday research activities. Access to the Internet will soon be universal, and this can provide unrestricted low-cost access to information as well as highly interactive distance learning and other benefits. The CGIAR must exploit these technologies more forcefully to promote its mission and also make them available to NARS (CGIAR Review Panel, 1998:6).

Although IRRI has made some initial steps in applying ICTs it could benefit greatly from the insights of a wide range of experts in this field. Partnerships with like-minded institutions could help IRRI refine its approach and improve chances for success and impact. It is almost certain that donors will find this an attractive option for the use of development funds. Perhaps the most influential of all donor agencies, the World Bank, has come out strongly in favor of ICT applications for poverty alleviation. In their recently released World Development Report – *Knowledge for Development*, they state,

Advances in communications have transformed society before: movable type, photography and telegraphy, the telephone, television, and the fax machine have all pushed outward the limits of our ability to store and transmit knowledge. Now the convergence of computing and telecommunications appears ready to shatter those limits, making it possible to send vast amounts of information anywhere in the world in seconds - at an ever-decreasing cost. This new technology greatly facilitates the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formation and execution, and widen the range of opportunities for business and the poor. One of the great hardships endured by the poor, and by many others who live in the poorest countries, is their sense of isolation. The new communications technologies promise to reduce that sense of isolation, and to open access to knowledge in ways unimaginable not long ago (World Bank, 1999:9).

The CGIAR and IRRI

With headquarters in the Philippines, IRRI was established in 1960 as the prototype for a world network of 16 nonprofit international agricultural, forestry, and fishery research centers supported by the Consultative Group of International Agricultural Research (CGIAR). The CGIAR, established in 1971, is a coordinating organization through which funds for international agricultural research are administered to various centers. The mission of the CGIAR is “*to contribute to food security and poverty eradication through research promoting sustainable agricultural development based on environmentally sound management of natural resources*” (CGIAR Review Panel, 1998:11). The CGIAR comprises donor countries, international and regional organizations, and private foundations. IRRI receives support from about 45 donors, including foundations and the international aid agencies of more than 30 governments.

IRRI's goal is *"to improve the well being of present and future generations of rice farmers and consumers, particularly those with low incomes"* (IRRI, 1998:ii). It is dedicated to helping farmers in developing countries produce more food on limited land using less water, less labor, and fewer chemical inputs, without harming the environment.

IRRI's interdisciplinary research programs concentrate on the four major rice ecosystems: irrigated, rainfed lowland, upland, and flood-prone. A fifth, the cross-ecosystems research program, focuses on research that will generate knowledge applicable to all, or several, programs. Two additional programs round out IRRI's research portfolio. The Rice Genetic Resources Program is responsible for collecting, storing, evaluation, and making available without restriction, a vast genepool of traditional and new rice varieties, wild rices, and biofertilizers. IRRI's Impact Program deals with the collection, exchange and distribution of rice-related information and knowledge, human capital development, and institution strengthening. This is the program that is making the greatest investments in the use of ICTs to fulfill its goals and objectives.

IRRI has a long history of contributing to information dissemination and human capital development in national agricultural research systems. Since 1962, over 8,000 training opportunities have been made available at IRRI headquarters to promising young scientists from 96 rice-growing countries around the world. Approximately 5,000 scientists have had the opportunity to participate in courses organized in collaboration with other national or regional institutions at national venues. In addition to the provision of these training opportunities, a major initiative of this aspect of IRRI's mission is to facilitate the devolution of training and to prepare national institutions to accept increased training responsibilities through the development of indigenous training capacity (Raab, et al, 1998).

IRRI's Training Center is responsible for initiating, developing and implementing the Institute's training activities. Center staff are involved in course development and implementation, curriculum design, and production of learning materials. The Training Center has primary responsibility for developing the Institute's capabilities in distance learning.

The importance of distance learning to IRRI's mandate

The world will need a great deal more rice—about 60 percent more than today's global production—to feed the extra millions who will rely on it within the next 3 decades. Highest growth in demand will be in areas of pervasive poverty and malnutrition, predominantly in South and Southeast Asia. Such an increase in production simply cannot be achieved with today's rice-growing technologies and farm management practices.

Tomorrow's technology and management must not only produce more rice per unit area, with less water and with less pressure on the natural resource base, but also maintain rice as an attractive crop for future generations of farmers. Those responsible for the development of these urgently needed technologies of tomorrow are the agricultural scientists of today. Their success will depend upon the knowledge, skills and attitudes they can bring to bear on the problems and their ability to work collaboratively with international research organizations as well as colleagues in other countries.

The most effective way to engender these abilities in national program scientists and ensure the development of appropriate scientific solutions to emerging rice production and utilization problems is through greater communication, sharing of information and training. The International Centers have invested much effort in both training and dissemination of information over the past 4 decades. However, with financial support for training decreasing throughout the CGIAR, this effort must look for more efficient mechanisms to achieve more with fewer resources. The application of modern, Internet-based communication and distance learning technologies offers the potential to significantly improve national agricultural research scientists' access to information and training. Such technologies can also facilitate increased collaboration through stakeholder participation, transparency and knowledge diffusion.

Experience with application of distance learning technologies

IRRI's Training Center, has long foreseen the potential of the application of ICTs in fulfillment of its mandate - the development of human capital in national agricultural research systems. IRRI's Medium

Term Plan 1998-2000 states that development of Internet-based training applications will be a major thrust of the Human Capital Development project through the end of the century and beyond. Several activities have already been carried out and many others are well under way. In November of 1997, the Training Center organized IRRI's first Internet-based videoconference lecture from IRRI headquarters to a group of international trainees gathered at the Rice Research Institute (RRI) in Thailand. A prototype Web-based course on Experimental Design and Data Analysis was developed and field tested in January 1998. All course materials for IRRI's train-the-trainer course were revised and published in .html format for eventual distribution via the World Wide Web.

The Training Center was recently awarded a grant from the PanAsia Networking program of the International Development Research Centre that allows its staff to refine the Experimental Design and Data Analysis course and explore the use of the Internet as a delivery medium. The primary target institution of the PanAsia project is the Directorate of Rice Research (DRR) in Hyderabad India. Discussions with DRR have already identified priority distance learning and communication applications.

Partners in this effort include two Vancouver-based institutions - the Center for Distance Education of Simon Fraser University and the Commonwealth of Learning. IRRI and these institutions are now in the process of solving connectivity problems with the DRR and the RRI and in developing courses. Another essential partner in these efforts is the Asia Pacific Advanced Network (APAN) with the goal of making available high performance network services for research and collaboration in the Asia-Pacific research community. Supported primarily by Japan's Ministry of Agriculture, Forestry and Fisheries Research Network (MAFFIN) and Japan International Research Center for Agricultural Sciences (JIRCAS), APAN includes members and contributors from most Asia-Pacific countries. The Training Center has already successfully used the APAN backbone to conduct a two-way audio and video teleconference between IRRI headquarters in the Philippines and the Training Center of Thailand's Department of Agriculture in Bangkok.

Future directions

Distance learning activities are well underway with India and Thailand and tentative plans and draft project proposals for distance learning efforts in Bangladesh and Vietnam have been developed. Emphasis in all countries will be on videoconferencing in support of national training events, Web-published training materials, and Web-based training courses. It is expected that the Center's first Web-based synchronous training course will be ready for delivery during the first quarter of 1999. An asynchronous, desktop to desktop, Web-based training course will be ready for delivery later the same year.

Also in the early stages of development is a project that would allow IRRI to exchange information directly with rural rice farmers using the "telecottage" approach. This activity is expected to be initiated by the end of 1999 with an NGO-sponsored community center in rural Northeast Thailand. IRRI's partner in this effort is the Population and Community Development Association of Thailand. The NGO BRAC in Bangladesh has also expressed interest in a similar project.

Opportunities for mutually beneficial collaboration

While IRRI has made good progress in distance learning with very limited resources and has a fairly clear idea about the priorities for this effort over the next few years, the Institute definitely needs to enhance its capabilities and examine the issues in much more detail as part of a forward looking strategic planning process. This can not and should not be done without an effort being made to involve a wide range of experts and taking advantage of their collective insights. IRRI is particularly interested in working with training providers - representatives from academia (both developed and developing country) and corporate training - and from our clientele - national agricultural research institutions and NGOs. Inputs from these sectors could help IRRI answer such questions as: What are the strategies/opportunities/technologies that have not been considered? What are the investments in hardware and connectivity that IRRI must make and when should these investments be made? What kind and what level of staffing will be required and how should these individuals be integrated into IRRI's existing organizational structure? What are the key alliances that must be made with advanced research and training organizations and national partners? What is an ideal level of investment in this area? Are there other questions that should be asked?

The importance of making available lifelong learning opportunities to IRRI's clients is well understood. As the CGIAR Review notes,

In industrialized nations, it is widely recognized that lifelong learning has become essential in a world driven by new science and technologies, with frequent retraining being needed for many professions. Fortunately we now have a new tool that makes this type of education much more readily possible. The World Wide Web is being used as a direct teaching tool that allows virtual classrooms of interacting students and faculty to be created through 'asynchronous learning networks'. Because the Web allows a course taught at one site to be taken by students anywhere in the world, it increases enormously the ability to build scientific and technical capacity in developing nations (CGIAR Review Panel, 1998:45).

Educating, and keeping educated, current and future national agricultural scientists is an objective shared by several sectors and each has something to gain through collaboration. Achieving this would directly contribute to the fulfillment of IRRI's mission. Universities would have the opportunity to enrich their course curricula, develop instructional staff, and reach greater numbers of students. Corporations would directly contribute to ensuring that new staff being hired were of the best quality and would be able to keep their intellectual edge. This is already happening in the developed world where the private sector is playing a prominent role in educating the workforce. As Schaaf (1997:A8) notes,

The case for distance training reflects a combination of fast-paced business practices with the greater knowledge firms require in the people who do the work. The traditional education system simply can't prepare the labor force for the modern world of work; nor can employees be kept up to date on changing work workplace requirements through conventional means, whether corporate or academic.

Some private corporations are even finding out that they can make a profit from Web-based courses that they sell to interested individuals and other corporations.

Summary and conclusions

It is clear that ICTs will revolutionize the way training is conceptualized and delivered in the coming years. Distance learning will become a major force for educating national scientists and ensuring that they remain up to date on emerging new concepts, procedures, and research approaches. If this can be accomplished, it has tremendous implications for addressing the inequalities that characterize developing country scientists' access to knowledge and information.

It is hoped that this paper will make a wider audience aware of IRRI and its work and of the opportunities to collaborate in IRRI's distance learning efforts. IRRI and all of the Centers that collectively comprise the CGIAR must take steps now to gain experience with and apply ICTs in support of their training and information dissemination efforts. A wise approach would be to involve a diverse group of partners that could contribute from their respective strengths and simultaneously further their own agendas.

The benefits of collaboration will go beyond just advancing the positions of the individual partners. If national agricultural scientists are equipped with up to date skills and have free access to the latest information, they will become a stronger force for development and be in a better position to deliver the technologies that can make a difference to the world's poor. Contributing to the realization of this goal is something everyone could be proud of.

The persistence of extreme poverty and deprivation in the midst of unprecedented prosperity destabilizes nations, promoting social disintegration and numerous conflicts and security threats. The international community cannot accept a future in which a large proportion of the world's population will remain poor and food-insecure. Even for industrialized countries, the economic, political, and ethical implications are severe (CGIAR Review Panel, 1998:5).

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