
USE OF ELEARNING TECHNOLOGIES BY THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH (CGIAR) CENTERS

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Abstract

The Consultative Group on International Agricultural Research (CGIAR) is “a strategic alliance of countries, international and regional organizations, and private foundations supporting 15 international agricultural Centers” (CGIAR, n.d.) in 14 countries (12 developing, 2 developed nations). The mission of the CGIAR is “to achieve sustainable food security and reduce poverty in developing countries through scientific research and research-related activities in the fields of agriculture, forestry, fisheries, policy, and environment” (CGIAR, n.d.). Training and human resource development are important components that are used to achieve this mission. Advances in technology are providing new and innovative ways to provide training and human resource development. The purpose of this study is to assess the use of elearning across CGIAR Centers and provide recommendations for increasing and improving the use of elearning in developing nations. An exploratory mixed-method (qualitative and quantitative) methodology was utilized. Five of the 15 Centers (33.3%) responded by completing the online survey. All Centers were evaluated based on elearning evidence displayed within their organizational web sites. Preliminary findings reveal that CGIAR is utilizing elearning technologies at different levels across Centers. As a group, respondents reported high-speed Internet access at their Centers with employees on staff that could assist with elearning initiatives. All five responding agencies recognize opportunities and benefits associated with elearning technologies, while maintaining an awareness of challenges and barriers. The information gained regarding technology infrastructure and how elearning is used by CGIAR research Centers allows others to better plan, implement, and use elearning in their programs.

Introduction & Background

The Consultative Group on International Agricultural Research (CGIAR) is “a strategic alliance of countries, international and regional organizations, and private foundations supporting 15 international agricultural Centers” (CGIAR, n.d.) in 14 countries (12 developing, 2 developed nations). The mission of the CGIAR is “to achieve sustainable food security and reduce poverty in developing countries through scientific research and research-related activities in the fields of agriculture, forestry, fisheries, policy, and environment” (CGIAR, n.d.). Training and human resource development are important components that are used to achieve this mission.

Advances in technology are providing new and innovative ways to provide training and human resource development. New mechanisms are being put in place that can assist in meeting training and development needs. These mechanisms come together to enable the use of elearning which can be defined as the delivery of training using multimedia over the Internet. While companies and agencies of developed nations are adopting technology-based training methods (Webb, 2003), only limited research has been conducted on elearning methods being used in developing nations. The fact that remote learning is being facilitated by the Internet (Williams, Nicholas, & Gunter, 2005), may impact the importance of and selection of models used for adopting elearning by centers located across the globe.

Hunt and Ivergard (2005) noted that it is important to focus on the context, purpose, and usability of elearning when planning and evaluating technology-based learning. Implementation of elearning often results in benefits (Berger, 2005) beyond the commonly cited reduction in travel expenses and increased flexibility. It also offers new ways to approach training challenges by allowing mixed-method approaches, pre-service and follow-up training, and increased time for scientists to spend on research in place of training.

Oyelaran-Oyeyinka and Lal (2005) noted that the spread of the use of the Internet is directly associated with access to telecommunications infrastructure, which varies from country to country. Similarly, the development of a viable elearning strategy is dependent on access to the Internet and issues related to bandwidth and connectivity. Allmand, Ramos and Soeripto (2003) discuss how the CGIAR libraries and information services of the CGIAR Centers are benefiting from working together to collectively share their knowledge. This example of collaboration to develop an infrastructure and network could also benefit the Centers if applied to the area of elearning. The potential for using elearning to meet training and development needs in developing nations is great, but must be adopted and implemented with a solid infrastructure and strategic plan for serving the targeted population appropriately.

Purpose

The purposes of this study are to: 1) assess the elearning technology infrastructure of the CGIAR Centers, 2) determine how elearning technology is being used to serve the CGIAR staff and their clientele, and 3) make recommendations for increasing and improving the use of elearning in developing nations.

Methods and Data Sources

An exploratory mixed-method (qualitative and quantitative) methodology was utilized in the study. Directors, training managers, and individuals associated with elearning were contacted in 15 CGIAR Centers in 15 countries via email to participate in the study. An information sheet was provided to allow them to determine whether or not they wished to participate in the study. A survey consisting of multiple choice and open-ended questions was provided online. The survey questions were designed to collect data on issues related to elearning, Internet and technology infrastructure, how elearning is being used, skills and experience of personnel working with elearning, and the challenges and opportunities for elearning. Respondents were coded in order of response with the codes A1-A5. Frequencies were used to describe responses to multiple-choice questions. Written responses were analyzed using the constant-comparative method (Lincoln & Guba, 1985) in which items were coded by category and compared with previously listed items in order to generate explanatory categories. These categories were then reviewed by the researchers together and more specifically defined. A peer debriefing was held

with individuals knowledgeable in the areas of elearning and international development to further assess categories. A qualitative analysis of each Center's web site was also conducted to collect additional data on elearning activities. Center web sites were assigned codes W1-W15. (See Table 1 for a complete listing of CGIAR Centers.). An audit trail and reflective journal were kept that included methodological decisions, thoughts/reflections, logistical information, contact lists, and coding. Given the small group size, coding was not included in the findings section to safeguard the anonymity of respondents. This research was approved by the Texas A&M University Institutional Review Board.

Table 1. Centers of the Consultative Group on International Agricultural Research and Associated Acronyms (N=15).

<i>Center Name (Acronym)</i>
Africa Rice Center (WARDA)
Center for International Forestry Research (CIFOR)
International Center for Agricultural Research in the Dry Areas (ICARDA)
International Center for Improvement of Maize and Wheat (CIMMYT)
International Center for Tropical Agriculture (CIAT)
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
International Food Policy Research Institute (IFPRI)
International Institute of Tropical Agriculture (IITA)
International Livestock Research Institute (ILRI)
International Plant Genetic Resources Institute (IPGRI)
International Potato Center (CIP)
International Rice Research Institute (IRRI)
International Water Management Institute (IWMI)
World Agroforestry Centre (ICRAF)
WorldFish Center

Findings

The findings presented in this paper are preliminary as data is still being sought from non-responding agencies. Five valid survey responses, representing five of the 15 agencies (33.3%), were received. (An additional response was received anonymously and could not be attributed to a particular Center, thus was not included.) All 15 agencies were evaluated based on elearning evidence displayed within their organizational web sites.

It is notable to begin by pointing out that it was learned during the study that the CGIAR alliance has recently embarked on a program to encourage the use of elearning across the Centers by working with the ARIADNE Foundation for the European Knowledge Pool and are pilot testing the use of a Learning Management System (LMS), MOODLE™.

CGIAR Centers' eLearning, Internet, and Technology Infrastructure

In assessing elearning infrastructure across the Centers, it is interesting to note that all five agencies responding to the survey indicated access to high-speed Internet. However, the infrastructure for their targeted clientele appears to vary from high-speed Internet connections to non-existent access. In response to the questions related to videoconferencing, respondents were split on this question. Three Centers reported having access to both compressed video conferencing capability and desk-top video conferencing capability. One Center reported only

access to compressed videoconferencing capability and another Center reported having no access to this technology.

All five respondents indicated that they employed content designers/developers and web master/programmers. Only two agencies indicated that they did not have a multimedia developer on staff. The primary Learning Management System referenced by respondents was Moodle™. This is not surprising given that this system was recently adopted by the CGIAR parent organization for use across Centers. However, it is important to note that other learning management systems (e.g., FirstClass™, TeN Acado™) were noted by respondents. In addition, the review of Center web sites reveals that at least one Center is utilizing a custom-created management system for course delivery.

CGIAR Centers' Use of eLearning

All five responding agencies reported that 10% or less of their training is being delivered via elearning technologies. When asked how elearning and technology is being used within their Center, respondents varied in response. *Staff training, staff meetings, and professional training* were all equally noted as ways they use the technology. However, it is important to note that three (50%) of the respondents specifically noted *information sharing* as a use and one respondent reported the use of elearning technologies to *contact farmers and experts*.

When asked who is receiving training and information via elearning technologies, responses also varied. While one respondent indicated that *staff, management, and researchers* were all involved in receiving training and information using elearning technologies, each of the other respondents selected a different combination. One respondent listed *students and visiting professionals* as receiving training via elearning. *CGIAR staff, CGIAR researchers, and other agriculture professionals* were also identified by respondents as receiving training via elearning.

When asked what percentage of training one would like to have delivered by elearning technologies in the future, two respondents indicated 10-25%, and three respondents noted 25-50%. When asked about the effectiveness of training delivered via elearning technologies as compared to traditional instruction, two of the respondents said that elearning was less effective, while two indicated it was more effective, and one reported that it was equally effective.

A review of Center web sites revealed interesting information. Examples of elearning, defined as the delivery of courses over the Internet, were identified in relation to three Centers. It was the exception when elearning courses could be easily recognized on a Center's web site. Two Centers were observed as having established specific web portals to organize elearning courses, thus making it easy to identify elearning activities.

While limited evidence of elearning was found at some Center web sites, it is important to note that all Centers did have training materials posted on their web sites. Training materials included lecture summaries, slides, video clips, etc., but no named courses. Analysis revealed that all Centers are utilizing multiple forms of media to make information available in a wide-array of formats, while not necessarily through formal online courses. Although analysis of the web sites provided valuable information, it is difficult to truly measure the extent of involvement in elearning by the Centers without direct contact with each of them.

In response to the question related to collaboration with other CGIAR Centers, it is important to note that two respondents indicated both past and future collaboration plans. One respondent indicated that elearning activities are primarily donor-driven and that in order to expand these efforts funding commitments would be required from core budgets.

Challenges and Opportunities Associated with eLearning to Deliver Training

In response to the question related to elearning challenges and barriers, respondents identified eight key concepts associated with using elearning to deliver training: (a) importance of hands-on training, (b) access/infrastructure issues, (c) time required to prepare material, (d) high cost to prepare material, (e) difficulty in capturing content, (f) multilingual/multicultural contexts, (g) lack of training/capacity, and (h) culture of training/motivation.

On the other hand, in their response to the question related to opportunities and benefits associated with elearning to deliver training, respondents revealed a belief that elearning does have potential application. Respondents revealed seven key opportunities/benefits: (a) blended learning opportunities, (b) consistent and comprehensive training, (c) lower cost, (d) meeting the needs of learners, (e) wider reach, (f) high re-usability, and (g) multi-institutional approaches.

Recommendations received from respondents for encouraging more effective use included the following key concepts: the importance of blended approaches, partnership projects with adequate support, funding support, recognition of audience knowledge /infrastructure [related to technology], and CGIAR-wide policy recognizing/supporting elearning. One respondent stated, “the model of e-learning [needs to] be refined in the context of teaching in our in-country environment.”

Efforts are underway to contact non-responding agencies. Findings reported within this paper are preliminary and reflect data collected from current respondents and through the evaluation of Center web pages.

Conclusions

Evaluation of the survey data yields interesting information regarding the use of elearning across CGIAR Centers. The fact that the CGIAR alliance has joined the ARIADNE Foundation for the European Knowledge Pool and are pilot testing an LMS demonstrates that the organization values the potential of elearning and is attempting to develop an elearning infrastructure to make it more accessible for the CGIAR network.

Quality of Internet access is a common concern when working in diverse settings; however the finding that all responding Centers have high-speed Internet access lends support that an infrastructure exists that can be used for elearning in support of staff and researchers located on-site at the Centers. In addition, while the availability of video-conferencing access varied among respondents the fact that 50% of the respondents indicated access lends additional support for use of this type of technology within a select group of Centers. Given that training is an integral part of the CGIAR mission and that the Internet has become a primary means for providing access to information, it is not surprising that Centers would employ content designers and web masters. This finding lends support for the potential development and application of elearning tools within the Centers by providing specialized training focused on the development and delivery of elearning.

Respondents recognize the potential for elearning and would like to implement it on a larger scale for uses including the training of staff, management, and researchers. While a limited number of Centers appear to have formal courses delivered via elearning, it is encouraging to see the large amount of media-rich content that is provided on Centers' web sites. The existence of this content provides opportunities for Centers to develop more formal courses using this media.

The finding that responding Centers are using diverse LMS programs leads one to conclude that some Centers were actively pursuing the use of elearning prior to the adoption of

the LMS, Moodle™ and that they see potential in the use of elearning. At the same time, respondents indicated a diverse reaction to the amount of training they would like to see delivered via elearning and how they perceived the effectiveness of elearning as compared to traditional instruction. While it is possible that this reaction relates to particular content or audience issues, it ultimately reveals a diverse perspective of elearning and supports the use of blended programs as a way to introduce and expand the use of elearning.

Each of the challenges/barriers shared by the respondents represents significant issues to be addressed in order to successfully implement elearning widely. In fact, comparison of items listed as challenges to items listed as opportunities reveals a number of contradictory responses. While the “high cost of preparing materials” is listed as a challenge, “lower cost [economies of scale]” is listed as an opportunity. And, while “difficulty in capturing content” is listed as a challenge, “consistent and comprehensive training” is listed as an opportunity. This leads one to conclude that respondents recognize the upfront investment that is required when using elearning technologies, yet also recognize that there are opportunities/benefits once the instruction has been created. Technology offers tremendous opportunities, yet one can conclude that based on responses collected, achieving the opportunities and benefits of elearning will require strategic planning to address the identified challenges and barriers.

Educational Importance

The educational importance of this study is grounded in the fact that gaining information about the technology infrastructure and how elearning is being used by CGIAR research Centers allows others to better plan, implement, and use elearning in their programs. As reflected in this study, leadership support is a critical element of success. The promotion and support of a common LMS by the CGIAR alliance reveals that the organization sees value in the use of elearning and recognizes that Centers may need assistance in utilizing this technology. In regard to connectivity and bandwidth, study results reveal tremendous opportunities for collaboration between Centers based on access to high-bandwidth at all responding Centers. Elearning technologies provide unique training opportunities that allow a broader reach, economies of scale, and consistent content. The preliminary findings of this study provide a sketch of how elearning is being utilized by those involved in training in international settings.

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