Training Professors in Internet Enhanced Education: A Case Study

Mario A. Núñez Molina, Ed.D.
University of Puerto Rico-Mayagüez
Department of Social Sciences
University of Puerto Rico-Mayagüez

> Assisting faculty efforts to integrate technology into instruction remains the single most important information technology challenge confronting American colleges and universities. (Green, 2001, p. 2)

The new communication and information technologies that have been made available through the Internet have the potential to significantly transform the teaching and learning process. (Bates, 2000, 1995; Palloff, 1999). The Internet provides resources that can enrich education, making the process, for students and professors alike, more dynamic, complete, interactive, and stimulating(Khan, 1997). Therefore, a 21st century university must be prepared to cope with the dual task of developing learning environments on cyberspace and evaluating the implications that these interventions have on the education process. (Cole, 2000; SchorKo, 2000). However, in order to successfully carry out this endeavor, support structures and systems that facilitate the faculty's adaptation to these new technologies must be developed(McCormack, 1997; Hannum, 2001, Butler, 2001, Marcinkiewicz, 2001).

This article's main purpose is to describe a training program on the development of learning environments on cyberspace for the faculty of the Department of Social Sciences of the University of Puerto Rico at Mayagüez. This Department offers bachelors degree in five main areas of study: Psychology, Sociology, History,

Political Science, and general Social Sciences. It is composed of approximately 40 professors and 850 students; and offers a significant amount of required courses for other departments and faculties throughout the University.

We have named our training model "Internet Enhanced Education" (IEE) because, unlike with distance learning, in the IEE model, the professor and students are actually and physically present in the classroom where they regularly meet, but the professor also uses the Internet to facilitate and enhance communication between class members, as well as to provide additional information about his or her courses and research interests.

The efforts to train the faculty of the Social Sciences Department in this Internet Enhanced Education model began in the year 1998. Since that year we have conducted research on this topic, provided numerous workshops and presented our findings at various congresses and symposiums. Among these activities, it is necessary to single out the Internet Enhanced Education Project (PECI, by its Spanish initials), which took place during the 2000-2001 academic year.

The PECI was funded by the central administration of the University of Puerto Rico, through the PFEI proposals program. Among other activities throughout the project, several different workshops were offered for the faculty; an online manual on the uses of the Internet for teaching was developed; a cd-rom

containing common applications was developed and provided to participants; and the Center for Internet Enhanced Education (CECI, by its Spanish initials) was created. CECI was created with the purpose of providing participating faculty members with the technological and human support necessary for the ongoing development and improvement of their digital skills; and with the purpose of assisting and training additional faculty members who didn't participate in the project but wish to incorporate Internet and Internet related technologies to their respective courses. An in-depth description of the project's results will be provided through this article.

I. Internet Enhanced Education (IEE)

Internet Enhanced Education is a teaching paradigm characterized by the following principles:

1. **Accessibility:** Once class materials are published on the WWW, students can access them anytime and from any place where there is a connection to the Internet (computer labs, their dorms or apartments, or any other place). The Internet is a gigantic library that is open 24 hours per day. (Driscoll, 1998).

2. **Integration of global and local resources:** The Internet allows for the integration of global information and resources with local articles and files created or developed by the professor. Hypertext enables students to

easily access information and thus study each subject from multiple approaches. In this way, students are not limited to the professor's perspective on the subjects being studied, and can benefit from the interpretations of a wide variety of experts on any given theme being discussed in class.

3. **Collaborative learning:** The professor and his/her students can humanize the cyberspace learning environment through the use of discussion forums, creating a virtual community. The WWW enables students and faculty to create a space for collaboration, conversation, discussion and exchange of ideas. Studies confirm that some students tend to participate more in virtual settings than in the traditional classroom. (Burum, 1992).

4. **Information can be easily and constantly updated:** Having course materials and readings available through the WWW, allows for easy and frequent updates. This makes courses more dynamic, interesting, and up to date.

5. **The Internet enables professors to portray information in a wide variety of formats:** Information can be presented through graphics, images, text, and animations, among others.

6. **Communication:** Students can interact with their peers and with the professor through synchronous and asynchronous communication tools, such as email, chat rooms,

and discussion forums. Thorough them, participants can offer information and receive feedback in a faster manner. These types of technologies can be effectively used to facilitate group collaboration and work groups. (Bonk, 1998).

7. **Open system**: Students are free to easily and instantly explore other sources, which is certainly not the case with traditional courses, which most of the time are limited to the textbook. This "open system" stimulates and promotes student's control over the learning process, although it does create the risk of providing too many alternatives (Palloff, 1999).

8. **Facilitates research**: Students can benefit from the use of search engines and databases available on the Internet while conducting their researches.

9. **Publishing**: The Internet provides a fast and inexpensive mechanism of publication for both students and professors. Students are motivated by the prospect of having their work published at their professor's website, or at their own websites; and thus, increase their efforts and strive to produce better works.

10. **Instant and unlimited access to online resources**: Through the Internet, students have unlimited and instant access to new advances and developments in any given area of study.

11. **Democratic learning:** The use of the WWW in the teaching and learning process promotes a democratic learning environment in which students can influence what they learn, how they learn it, and the order in which they learn it. For example, in web enhanced education students can add links to the resources area of the course web page.

12. **Online assessment:** A wide variety of assessment and evaluation tools can be incorporated to a web-enhanced course, such as: individual tests and quizzes, participation in discussion forums, and development of portfolios, among others. (Burum, 1992).

13. **Virtual office hours:** Email and "chat" tools enable professors to extend their office hours without actually needing to be in his or her office. This makes them more available to their students. (McCormack, 1997).

14. **Distribution of course documents and materials**: The Internet can be used to distribute class materials, such as assignments, class notes, and readings. Having this documents available online eliminates the need for professors to make, carry and hand out photocopies; and students have easy access to this documents from anywhere with an Internet connection. (Willis, 1993).

With all the above described characteristics and advantages that are made available through the Internet Enhanced Education (IIE) model, the integration of this paradigm to the higher

learning process is well worth the effort for every university.

II. Components of a training model for faculty in Internet Enhanced Education

A. Areas to be covered:

One of the first questions we must ask ourselves when attempting to initiate a faculty training program is which are the topics and areas to be covered during training. Once the scope of the training process is determined, it is also wise to organize the proposed areas into different levels of training, beginning with the most basic skills, and progressively increasing the degree of complexity in subsequent levels. With the purpose of providing guidelines to facilitate the development of future training models, the following is a description of various levels of training and the corresponding skills that should be developed on each one.

First Level: Digital literacy skills

Our experience in training faculty for over three years leads us to conclude that, for most professors, training needs to begin with the development of the most basic technological skills. Without these skills, commonly described as digital literacy, it is almost impossible to develop learning environments on cyberspace. Therefore, before attempting to train professors in web page design or in the use and administration of systems such as WebCT, the trainer must verify that each participant has

mastered the following skills:

1. File management: It is essential for participants to be able to identify and access files, directories, and hard disk components;

2. Ability to scan images, use digital cameras, and manage basic features of image editing software;

3. Configuration of Internet browser, and how to store and access bookmarks or favorites;

4. Searching and researching skills on the Internet using search engines and databases;

5. Critically evaluate the quality of the information available online;

6. Use of email, chats, mailing lists, discussion forums, and newsgroups;

7. Use of file compression software: These allow users to reduce the size (compress) of a file to diminish the required storage space and thus facilitate file exchange and sharing;

8. Familiarization with pdf format and with the use of Adobe Acrobat.

Second Level: Web Page Design

After participants have mastered the basic skills described on Level I, they will be ready to receive training on the use of HTML editors, which are software used to design and publish web

pages. Some of the skills that should be developed on this second level include:

1. Converting word processor documents into web pages;

2. Transferring files using FTP software: Based on our experience, one of the best file transport programs is CUTE-FTP (http://wwww.globalscape.com). We also recommend AceFTP, which is available free of charge.

3. Development of web-based presentations using PowerPoint; and

4. Learning how to use an HTML editor to create and publish a web page.

At the Center for Internet Enhanced Education (CECI, by its Spanish initials), we chose Trellix Web® as the HTML editor in which to train faculty because it is amazingly user friendly and it has most of the components that professors need to manage their courses on the web. In our experience, faculty members with little or no digital literacy can easily learn how to use Trellix. Other editors, such as FrontPage® and Dreamweaver® require more time and effort in order to effectively master their use. Thus, we feel the latter are not appropriate editors for training professors who are beginning to develop these types of skills.

Third Level: Management of a web course development platform

As a web course development platform we are using WebCT®. WebCT is one of the most frequently used virtual platforms by colleges and universities in the United States. Its creators, Murray Goldberg and Susan Salari, began developing WebCT with a grant from the University of British Columbia in 1995. The first edition of this product was available to consumers in the year 1997. In 1999, Universal Learning Technology and WebCT joined forces to promote and commercially distribute this product.

All of the comparative studies consulted (Firdyiwek, 1999; Frederickson, 1999; Gray, 1998) concur in describing WebCT as one of the best web course development platform available, particularly because of the variety and amount of resources it provides to students and professors. WebCT provides students multiple learning, collaboration and communication tools, such as: discussion forums, internal email, chat rooms, self assessment tools, image database, glossary, online password-protected grade book, and a calendar on which students and professors alike can post events.

It has been our experience that, since WebCT offers so many tools and resources, mastering it requires a significant amount of time. Therefore, if the available time for training is scarce, we recommend using Blackboard (**www.blackboard.com**), which is easier to master and provides all the necessary resources and

tools to develop an online course.

Another virtual platform alternative that has been effective throughout our training is the Internet Classroom Assistant (also known as "Nicenet"). Although Nicenet does not offer all the tools available through more complex systems, such as WebCT, it is very useful for faculty members who are just starting out in the process of enhancing their courses with online resources. Nicenet (**http://www.nicenet.org**) was created in 1995 with the purpose of providing useful tools for distance and collaborative learning. It offers students and professors the opportunity to discuss class related topics online and to submit and access class related documents. We have developed an online instruction manual or user's guide for Nicenet, which can be accessed at the following url: **http://www.uprm.edu/socialsciences/nicenet/index.htm** .

Fourth Level: Pedagogy and Internet Enhanced Education

In this fourth level we leave behind the technical skills and concentrate on analyzing the pedagogic processes involved in Internet enhanced education. It is, therefore, the most complex level. Precisely due to this complexity, most models for training faculty in online teaching are limited to the coverage of areas described on the first three levels of our model, losing sight of the fact that the purpose of such training is the improvement of the teaching and learning process. An example of a training model that emphasizes this fourth level is the one used in the online

course entitled *Teaching Online in Higher Education*, which is offered by the Center of Distant Learning of the University of Texas-Pan American. (http://cdl.panam.edu/2001/Faculty/toihedu.htm).

In this fourth level, the following topics should be discussed:

1. Teaching and learning styles;
2. Development of learning objectives;
3. Assessment of distance learning;
4. Interactivity as a central element of Internet Enhanced Education; and
5. Instructional design.

B. Types of training:

Another important dimension of faculty training is the manner in which it will be offered. Multiple alternatives are available:

1. Training can be offered entirely online;
2. Training can be made available in CD format, using software such as Viewlet, available at http://www.quarbon.com;
3. Training can be offered in a traditional face to face setting;
4. Training through video or television;
5. Training can be hybrid, using a combination of different types of training (web-based, CD format, face to face)

At CECI we have emphasized traditional face-to-face training.

However, we have recently begun to complement this method of training with the use of CD format, using software such as Viewlet(www.quarbon.com). We have also developed multiple tutorials which are available online: (http://www.uprm.edu/socialsciences/eci).

III. Components of the Project for Internet Enhanced Education

The following is a description of the components of the Project for Internet Enhanced Education (PECI). During the PECI the following activities were carried out:

1. Training on the development of learning environments on cyberspace:

We offered ten, two-hour long, workshops. Training was given on the following topics:

a. Searching and researching on the Internet;

b. Introduction to WebCT;

c. Web page design using Trellix Web;

d. Teaching applications of electronic discussion forums and mailing lists;

e. Assessment of Internet Enhanced Education;

f. Developing learning environments on cyberspace with the use of Nicenet; and

g. Creating interactive forms and online questionnaires.

All participating faculty received a specially designed CD that contained useful tools, such as: win-zip, Netscape, Internet Explorer, and FTP programs, among others.

2. Online manual for the development of courses on the Internet:

As part of our training project, an online manual on Internet Enhanced Education was developed. It is available online at: (www.uprm.edu/socialsciences/manualprofesor). This manual was used as our guide throughout the workshops. It includes the following:

a. Introduction to HTML;
b. Surfing the Internet;
c. Researching on the Internet;
d. Using email in the virtual classroom;
e. The electronic discussion forum as a teaching tool;
f. Advantages and disadvantages of the cyber classroom;
g. Introduction to the Internet Classroom Assistant (Nicenet);
h. Links and resources for the virtual professor;
i. Implications of Internet use in the teaching process; and
j. Evaluating Internet Enhanced Education

3. Creation of the Center for Internet Enhanced Education (CECI):

Since participating faculty would undoubtedly need technological resources to develop their digital skills and create learning environments on the Internet, we created the Center for Internet Enhanced Education (CECI). At CECI we provide individual support and tutoring to faculty members on the use of these new technologies; and it also allows them to

practice what they have learned at the workshops. CECI provides professors access to useful software such as, Adobe Acrobat, PhotoShop, Front Page, and Trellix, among others. Likewise, CECI has relevant literature (with magazines such as Presentations, Converge, Syllabus and The Journal, among others) for faculty members who are developing learning environments on the Internet.

CECI also publishes Hermes, a newsletter/journal on the topic of Internet enhanced education. Its initial purpose was to provide information about the Center's activities, but it has rapidly evolved into a journal devoted to the discussion of interesting and sometimes controversial issues arising from the use of the Internet in the education process. Hermes also provides an opportunity for faculty members to share tools, resources, articles, and links about Internet Enhanced Education.

IV. Virtualization of the Department of Social Sciences

1. Development of e-books

One of the results or our faculty's ever increasing degree of enthusiasm for the use of these new technologies has been the development of electronic books (e-books). For example, various professors of our Department have contributed to the development of an electronic book entitled Temas en Ciencias Sociales (Themes in Social Sciences), which is available on CD format, and is used as the textbook for our Introduction to Social Sciences course. Dr. Sonia Ruiz, the book's editor, was one of the participants of

the PECI project. As a result of the training received during the PECI project, professor Ruiz developed the skills that have enabled her to undertake this task of developing the electronic textbook.

Other ebooks that have recently been developed by our faculty are:

1. Sexual Education (available at www.josephaguero.org)
2. Eugenio María de Hostos : Puerto Rican Educator in Chile (academic.uprm.edu/sruiz/hostos_chile)
3. Folk Healing Systems (www.uprm.edu/socialsciences/sistemasfolcloricos)

2. Web pages created by PECI's participating faculty members:

As a result of the workshops that have been offered, faculty members from our Department have acquired skills that have enabled them to effectively integrate the use of these new technologies and of the Internet in their teaching processes. Some participants have created their own web pages to enhance the teaching of their courses. These are:

Prof. Eddie Marrero (academic.uprm.edu/~eddiem);

Prof. Sonia Ruiz (academic.uprm.edu/sruiz/soniaruiz);

Prof. Yesenia Pumarada (academic.uprm.edu/~yeseniap);

Prof. Joseph Agüero (www.josephaguero.com);

Prof. Luis Avilés (academic.uprm.edu/~laviles); and

Prof. Manuel Valdés (academic.uprm.edu/mvaldes/index.htm). I also have a website, which was created in 1997, and which I continually and frequently update. It can be accessed at the following url: www.mario-nunez.org.

3. Impact of the PECI project in teaching, in students, in the curriculum and in the administration :

PECI's impact can be described as a transformation and modernization of the teaching methods in the Department of Social Sciences. Various professors from our Department have started to use laptops and digital projectors to present material to their students during their courses.

As a result of the PECI project, our Department now has a website (www.uprm.edu/socialsciences) through which visitors can access information regarding our courses and faculty. We have also trained one of the Department's secretaries in the management of an html editor, and this has been helpful for the development of our recently established digital archive of administration related documents.

Likewise, the development of a culture that values these new information and communication technologies has significantly impacted our students. Student organizations have started to publish websites, and individual students have also discovered the advantages of having a presence on cyberspace.

The project has also facilitated the creation of two new courses: *Psychology of Cyberspace*, and *Searching and Researching*

on the Internet. We have also submitted a proposal with the purpose of assessing the impact of the wireless classroom in the teaching of various courses.

Our Department is not the same as three years ago. Each day, more professors, students and administrative personnel are becoming increasingly motivated to learn about and participate in the Internet Enhanced Education paradigm. In the hallways, most conversations now involve references to emails, online teaching, and the new communication and information technologies. We have purposely and rapidly begun our transformation, from the traditional transparencies projector to the digital one, from the traditional textbook to ebooks and electronic documents, and from the formerly exclusive emphasis on traditional face-to-face classroom interaction to significantly appreciating Internet enhanced education.

V. Difficulties and problems: The dark side of the training process

It is necessary to mention the difficulties and problems we encountered because acknowledging them makes it easier to handle them effectively. One of the main problems in faculty training on Internet enhanced education is the issue of providing an incentive to participating faculty. In our case, the professors who participated in the PECI project did not receive monetary compensation, and they did not receive academic workload relief.

Their participation, commitment and enthusiasm are therefore highly admirable.

However, various professors have complained that they don't have enough time to practice the skills they need to develop in order to effectively develop learning environments on the Internet. We, thus, highly recommend providing participating faculty in similar training programs with an academic workload relief.

Another difficulty that we have encountered is how to obtain the funding needed to run CECI. At the present moment, and ever since its creation, CECI has been funded exclusively by research proposals. It was with the proposal for the PECI project that we acquired the technological equipment (computers, scanner, printer, digital projectors, etc.) that first enabled us to create the Center; and it has been through subsequent research proposals that we have managed to keep the Center open and providing services and workshops for our faculty members. We believe, however, that the University should assign the Center a recurring budget, so that its existence and continued support need not depend exclusively on research funds.

Last but not least, the University of Puerto Rico hasn't developed an institutional policy to facilitate the faculty's use of these new information and communication technologies. It is necessary to define a strategy that can coherently guide this process, and it should be done as soon as possible. Otherwise,

the virtualization of the University will be a mere illusion, which will never be achieved.

VI. The future of Internet Enhanced Education at the Department of Social Sciences

The future of Internet enhanced education at the Department of Social Sciences goes hand in hand with the creation and continued development of the Center for Internet Enhanced Education (CECI). CECI is now a permanent component of our Department and of the Faculty of Arts and Sciences of our university. Each semester CECI offers workshops on topics such as WebCT, Trellix Web, Nicenet and FrontPage. We also coordinate activities with the sole purpose of providing faculty members an opportunity to analyze, discuss and reflect upon the impact of technology in the teaching and learning process.

We are interested in developing research on Internet enhanced education. CECI collaborates with faculty members on research with Internet related components. For instance, we have recently funds for the development of online training modules for health professionals who work with HIV+ and AIDS patients. This proposal has been approved and the development of the training modules will begin on January 2003. We have also submitted a proposal to the central administration of the University of Puerto Rico for the evaluation of the implications of the wireless classroom. We are also working on a proposal for the

implementation of open source online management course systems such as Manhattan Virtual Classroom and Claroline.

V. Conclusion:

The integration of the new information and communication technologies to the teaching process makes it possible to transcend time and space limitations, allowing students to learn in a wide variety of contexts using multiple resources. (Bates, 2000; White, 2000). It is of utmost importance that universities offer support, training, and resources to faculty members who are interested in developing learning environments on cyberspace, because these efforts will result in their being able to provide students a more complete and effective education.

We hope the training model described in this article can facilitate the development of similar training projects at other universities.

References

Bates, A. W. (1995). Technology, open learning, and distance education. New York: Routledge.

Bates, A.W. (2000). Managing technological change. California: Jossey-Bass.

Bonk, C. (1998). Electronic collaborators. NJ: Lawrence Erlbaum

Brooks, D. (1997). Web teaching: A guide to designing interactive teaching for the WWW. New York: Plenum.

Burum, D. (1992). Formative Evaluation of Computer Courseware: An Experimental Comparison of Two Methods. Journal of Educational Computing Research, 8 (1), pp. 69-80.

Butler, D. (2001, July/August). Faculty development at the grassroots level. The Technology Source. Available online at http://ts.mivu.org/default.asp?show=article&id=904

Cole, R. (Ed.)(2000) Issues in web-based pedagogy. CT: Greenwood

Publishing Group.

Dasher-Alston, R.M. & Patton, G.W. (1998). Evaluation Criteria for Distance Learning. Planning for Higher Education, 27 (3), pp. 11-17.

Driscoll, M. (1998). Web based training using technology to design adult learning experiences. Chicago: Pfeiffer.

Firdyiwek, Y. (1999). Web-based Courseware Tools: Where Is the Pedagogy? Educational Technology. 39, 29-34.

Fredrickson, S. (1999). Untangling a Tangled Web: An Overview of Web-based Instruction Programs. *T.H.E. Journal*. 26, 67-77.

Gray, S. (1998). Web-based Instructional Tools, Syllabus, 12, 18-22.

Green, K. (2001). Campus computing survey. New York: Campus Computing Project.

Hall. B. (1997). Web based training cookbook. New York: Wiley.

Hannum, W. (2001, September/October). Professional development for teaching online. The Technology Source. Available online at http://ts.mivu.org/default.asp?show=article&id=898

Horton, W. (2000) Designing web based training. New York: Wiley

Khan, B. (1997). Web based instruction. California: Educational Technology Publications.

Marcinkiewicz, H. (2001, May/June). The role of centers of teaching and learning in integrating technology in instruction.

The Technology Source. Available online at http://ts.mivu.org/default.asp?show=article&id=863 .

McCormack, C. (1997). Building a web based education system. New York: Wiley and Sons.

Meléndez, J. (1999). El poder de la educación a distancia. Bayamón: Editorial de la Universidad Central del Caribe.

Morley, D. (1999) . Harcourt Guide to the WebCT. Florida: Harcourt Brace.

Palloff, R. (1999). Building learning communities in cyberspace. California: Jossey-Bass.

Reddick, R. (1996) The online student. New York: Harcourt.

Schor Ko, S. (2000). Teaching online: A practical guide. New York: Houghton

Verduin, J. (1991) Distance education: The foundation of effective practice. San Francisco: Jossey-Bass.

White, K. (2000). The online teaching guide. MA: Allyn and Bacon.

Willis, B. (1993). Distance education: A practical guide. N. J.: Educational Technology Publications.