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# Information Systems Education in an Interdisciplinary International Arena

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What happens when American and European university students from diverse disciplines share educational experiences across the Internet? This question and the many related challenges were investigated in a research project during the 1999 academic year involving seventy-five students from eight countries with backgrounds in Information Systems, Computer Science, English Drama, Philosophy, and Philology. The common course centered on Internet programming, with students sharing assignments and projects that were placed on the Internet for the whole world to see. The result was a challenging and interesting experience for all involved.

A summary of the pilot project follows. The experiences described were used to expand the project for summer 2000 to include additional universities in Germany, with planned expansion in summer 2001 to include universities from Sweden and Mexico.

## I. BACKGROUND

Under the charge of researching and reporting on challenges facing universities when they begin to globalize their educational programs, a research project was formulated to better facilitate academic and institutional structures leading to faculty and student international interaction in Information Systems and related courses. An American university (Florida Gulf Coast University) and a European university (Bayrische Julius-Maximilians-University, Würzburg) were selected to cooperate in developing and offering the course via the Internet for their respective audiences. The American university was a new university founded by the State of Florida with the specific mission of exploring information and pedagogical technologies for both teaching and scholarship. By contrast, the European university was one Europe's oldest and most prestigious universities. It has a long academic history dating back to the sixteenth century. Over four hundred years difference in age

and tradition separated the universities. Yet their students met on common ground in the virtual space of the Internet.

## II. CONSTRAINTS

A set of constraints effecting all decisions was outlined at the beginning of the project. The purpose of these constraints was to ensure that each aspect of the project would mirror as far as possible actual course offering conditions.

1) *The Course*: Any course offered had to be a catalogued university course that could be structured for distance learning. It was not to be an extended correspondence course and it was not to be a one-time special project course. The course was to provide ample opportunity for appropriate interaction between students and faculty. Students were to be exposed to course material that was current, challenging and above all they were to have access to university faculty who demonstrated expertise in their fields through teaching evaluations and scholarship in an applicable field. Student experiences were to be the equal to or surpass the traditional structured classroom/lecture format.

The language of the course was to be English. European students would be expected to interact on the projects with American students in English, while it would not be expected that American students would demonstrate an ability to communicate in a foreign language, especially if several European languages were involved.

2) *Funding*: The two universities were to share, not necessarily equally, in resources and costs with the special caveat that all funding had to be from 'normal' sources. This meant that each was to plan and deliver the course in much the same manner as they would for any other Internet related course. In no case was external or one-time funding to be used. Any course selected was to be considered a catalogued course that could be regularly offered. The only exception to this constraint was that faculty members involved could be

awarded travel funding. This was to ensure proper pedagogical considerations and preparation so that they could gain an understanding of the milieu and circumstances of their counterparts and their students.

3) *Faculty*: One faculty member was to be assigned to deliver and manage local sections, including reviewing assignments, providing feedback and grading (or, as in the case of the European university, completing students' documents). A second faculty member was to facilitate delivery of technical services, such as network and server availability. As stated above, faculty members were expected to have demonstrated teaching and scholarship in an applicable field. Pay and rewards for the faculty members were to be at the local rate and custom and were not to be compared between the universities.

4) *Students*: Students were to be the focus of the course and were to gain an international Internet experience. The students were to come from differing academic disciplines. They were to be assigned challenging course material and they were to participate on projects that could be applied to actual academic or community related practices. Prerequisites might be expected providing they had been readily available and were not specially designed for this course. The challenge was to have enough regularly enrolled students in each of the sections to justify the respective section however each university justified and implemented the section - but without additional funding.

## EXECUTION

1) *The Course*: The course chosen was titled "Internet Development and Programming." It was to go beyond basic HTML structures and include dynamic Internet programming structures (DHTML) and server side computing (with ASP, etc.). Students were expected to have a background in Visual Basic, or C/C++, or Java. Assignments included five HTML exercises, three DHTML exercises and participation in a joint project. All projects were to have appropriate interfaces and to interact between clients and remote databases. The projects included, among others, web sites for an international academic journal, for foreign language pedagogy, for small business client tracking, for Q&A, for organizing and display student progress, and for managing marketing questionnaires.

The summer semester was selected because both universities normally scheduled semester courses from May through July. Because the American university did not normally provide student assistants during the summer session and in order for the project's funding constraints to be maintained, assistance in downloading and managing student exercises was not available. This was left to the faculty member and proved

enormously time consuming. Some limited help was available at the European university. However, this was limited.

Course logistics included server management through the American university and e-mail and physical operations through the European university. To reduce impact on the servers, assignments were due late Sunday, before midnight. This convention served not only to use server time that would otherwise be free but also used the time differences to have all work available early Monday morning. The European students did receive a little extra time after midnight, as Sunday midnight in America was early Monday morning in Europe. Late assignments were not accepted.

Because this was a common course with common requirements, students were required to obtain the same course materials and to work from them. Easy enough in America with a university bookstore and opportunity to order materials for distance learning courses through the Internet. This proved not so easy in Europe. The course texts, while available through Internet book dealers, were expensive and slow to arrive. Students accepted the costs and delays, but the problem was unforeseen and disconcerting.

2) *Funding*: Before the course could be made available, it had to be scheduled and advertised through regular university channels. The immediate questions of ownership, faculty assignments and rewards, and FTEs were resolved by each university scheduling a section of the course and internally funding it according to accustomed procedures. Sections were then announced through the usual semester course listings, which contained statements that the course was to be offered one hundred percent over the Internet and that students would be expected to work on projects with students from other countries via the Internet.

One interesting aspect of this solution was that the American university could through its registration procedures predict the number of students who would be enrolled in the program. This justified the funding in advance. Because it had no early registration procedures, the European university could only guess at a number. If insufficient numbers showed up on the first day of class, according to the constraints, the section would have to be canceled - or at least some other arrangement would have to be made. Since over seventy students enrolled in the two sections, with enough in each section to justify local funding algorithms, this proved in the end not to be a concern.

The European faculty member visited the United States during the Spring semester. This faculty member met students, attended classes offering course prerequisites, and met with administrators. The American faculty member was

assigned a one-semester course (3 credits) released time to consult with the European counterpart and to develop course web pages. This assignment was normal and was an expected part of developing a new Internet course. The American faculty member spent time in Europe during the execution of the course and was granted access to the host-university's computer systems. Both universities assumed normal operational technology costs.

3) *Faculty*: The faculty members chosen to offer the two sections were experienced teachers and both had international experience. The American faculty member had a terminal degree in the Arts and Sciences in Language and Literature and Post-Doctoral Master of Science in Information Systems. This faculty member had also previously developed and supervised distance learning courses. The European faculty member assigned to aid in the delivery of the course had regularly offered seminars in several European countries and understood distance learning applications. Both faculty members were also current and active in their fields. The American faculty member was formally listed as the instructor of the course with strong logistic and organizational support from the European counterpart.

The assignments had to be logged, stored in appropriate student folders, unzipped and examined. Once graded, each had to be returned separately with any helpful comments and reinforcements. Then the course Q&A page was updated with comments and any directions or changes as a result of the previous assignments. This process was extremely time-consuming, but course feedback indicated that the individual responses to each student were perhaps the most significant factor in the success of the course. Students believed they were receiving individual attention that actually exceeded what one might normally expect in a regular course.

4) *Students*: Students responded well to the course and its demands. They had an assignment due about every seven or fourteen days and almost without exception the assignments came in on time and well done. For the American faculty member this was unexpected because some of these same students in taking an earlier course had not always been so prompt. The Europeans, perhaps less used to regular assignments and exams, also submitted work that was prompt and well done. Some had a time management problem in that they delayed work for other courses with a shrug and a comment that it could be finished later. In every aspect, student achievements mirrored or surpassed that of live sections. This was true in spite of the fact that, as the course progressed, assignments and the projects became quite challenging.

The students reacted well to the course and returned extremely favorable reviews. Where such a course might become tedious after six or seven weeks, the introduction of the projects sparked interest and enthusiasm. Well after course completion, students remained in contact, exchanged goods and ideas, and several European students planned to visit their American counterparts during the next Spring Break. For the students, the course proven very worthwhile and was well received.

## SUMMARY OF LESSONS LEARNED

1) *The Course*: The chosen topic for the course proved important. The faculty and students worked in an environment that mirrored course content. Technical support for the course reflected normal course delivery. Faculty were often scurrying and bargaining for necessary staff support. This included such items as password management, project registration on the server (such as ODBC declarations), downtime recovery, FTP/Firewall privileges, etc. Both faculty members were experienced in working with computing center staff. However, student numbers were large and procedures for quicker and more positive response were needed. The ability of students to FTP web pages to server and to test the interaction of these pages with databases stored in the server was critical to the project. They needed to have a system that was always up and running (because of the time differences) and they needed positive response time (esp. the Europeans, who, in contrast to the Americans, pay unit phone rates, etc.).

For this to be effective in the future, computer center *staff* need to establish *priorities* that put *students* rather than equipment *first*. This is easier said than done. However, it is absolutely necessary in both the short and long runs if such a course is to be successful. Faculty members should not have to develop and expand 'political capital' to achieve goals necessary for student success.

The textbook issue needs to be better resolved in favor of the students. It is nearly impossible for university faculty to prepare web pages that reflect current industry practices in Internet programming and development. The area is moving too fast. Professional texts are needed, and these need to be made available inexpensively and in a timely manner. There are now book dealers on the Internet and the resulting competition may soon level the field for all students.

Students needed more lead-time to begin the projects. Since they did not know one another and were not expected to have face-to-face organizational meetings, there was a need for students to establish contact, exchange e-mail addresses and arrange for working around time differences.

The course provided several opportunities for formal interaction, including a course webboard. This webboard was one of the best with the most current options. However, students quickly abandoned these dedicated resources and elected to communicate via e-mail; and rather than FTPing files, etc., they chose simply to use e-mail attachments.

2) *Funding*: From an administration viewpoint, the course was delivered within the stated constraints. The course was very successful. However, if such international Internet courses are to be developed and delivered to hundreds of students with little faculty and material costs and if they are at the same time to provide quality interaction with the students, then a different format will have to be developed. Because constraints prevented the course from being a correspondence course with limited faculty-student interaction, students received written and detailed feedback on all assignments and could interact with their faculty member at any time via e-mail. It was the quality of the interaction between the student and the faculty member that made the course successful. This would mean more faculty with less students per section. The costs for a successful *Internet* (versus a correspondence) course proved 'in toto' actually *greater* than for a standard lecture course.

3) *Faculty*: The amount of time spent in course logistics was for the faculty members basically a waste of time. This aspects needs to be automated as much as possible and students should probably simply FTP their assignments to their folders themselves so that their assignments can be viewed as an end product. This was done for the projects and it worked fairly well after the initial learning curve. Faculty members found that course preparation and delivery became a *full-time* endeavor - for a *single* course.

Because of the nature of the course, the course cannot be canned and will need revising each time it is offered. This implies that the course can not be simply loaded and delivered without continuous faculty involvement. It also rules out using web pages and graders alone to deliver the course. An Internet course that is successful for the students needs heavy faculty involvement.

There was a decided pay differential between the two faculty members, which was basically explained that each would have been paid the same for any other similar academic endeavor. Yet, the differential remained.

The faculty much enjoyed closer contact and interaction with the students. Although time consuming, the reward for the faculty was student success and a new and interesting experience. However, the time demands and the pace, for a single course, can not be justified on an ongoing basis. There need to be *parameters* that enable to the faculty member to present a *successful* course and at the same time complete other courses along with service and scholarship obligations.

4) *Students*: As stated above, students found the course challenging, worthwhile, and responded especially well to meeting and working with students from other countries over the Internet. They rated the course very high and would look forward to repeating such a course. Also of special importance was the chance for interaction with faculty.

Of all the lessons learned, the most important were not only that a student-orient, well planned and delivered Internet course is expensive, that it is time-consuming for the faculty member, and that it needs special logistics and technical support. It was that students respond well to such a course and that they take advantage of opportunities to work with their counterparts in other countries. They are willing to invest the time and effort needed to make the course work for themselves and their colleagues. Herein lies perhaps the greatest value of such a course.

#### Bibliography

This project currently uses the bibliography provided by: Phipps, R., and J. Merisotis. "What's the Difference? A Review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education." The Institute for Higher Education Policy, Washington, D.C. (1999). Available: <http://www.ihep.com/difference.pdf>.