Record 106 of 216
CAN YOU SUPPLY? YES NO COND FUTUREDATE

:ILL: 481290 :Borrower: MUU :ReqDate: 20031027 :NeedBefore: 20031126
:Status: IN PROCESS 20031027 :RecDate: :RenewalReq: 
:OCLC: 26325657 :Source: Clio :DueDate: :NewDueDate: 
:Lender: OSU, OSU, AZN, NOC, NOC 
:CALLNO: *Lender's OCLC LDR: v.1-1993- 
:TITLe: Interpersonal computing and technology IPCT.
:IMPRINT: Washington, D.C. : Center for Teaching and Technology, Academic Computing Center, Georgetown University, c1993-
:ARTICLE: Alexander "Collaborative design, constructivist learning..."
:VERIFIED: OCLC ISSN: 1064-4326 [Format: Serial Electronic]

:PATRON: Keast, Dan

:SHIP TO: 
Interlibrary Borrowing
University of Missouri-Columbia
103 Ellis Library
Columbia MO USA 65201-5149

:BILL TO: FEIN #436003859 
:SHIP VIA: ARIEL OR U.S. MAIL :MAXCOST: $45.00 IFM
:COPYRT COMPLIANCE: CC
:E-MAIL: ARIEL 128.206.59.219

:BORROWING NOTES: ClioID: A0017089///HomeLib: Ellis SSponsor: SLoc:
:SDate: DL: Comments: RType: Research NotNeededAfter: 
:AFFILIATION: MERLIN/MOBIUS/GWLA

10/28/2003
COLLABORATIVE DESIGN, CONSTRUCTIVIST LEARNING, INFORMATION TECHNOLOGY IMMERSION, & ELECTRONIC COMMUNITIES: A CASE STUDY

Johanna Olson Alexander

California State University, Bakersfield

ABSTRACT

Information technologies have provided an opportunity for teaching faculty and library-information faculty to combine expertise and resources to change, develop, augment, and enhance instructional course design. Collaboration of teaching and library faculty capitalizes on the content expertise of the professor and the productive use of information resources and technology by the librarian. This article describes a collaborative instructional design project using constructivist theory, exploratory and resource-based learning, electronic communities, and integrated information technology immersion. Learning outcomes for student and faculty participants are discussed and analyzed in relationship to pertinent research and theory. Recommendations for future enhancements are presented.

INTRODUCTION

Funded by a University grant to promote "pilot efforts to improve learning productivity" (W. Barbour, personal communication, May 6, 1996), a graduate health services planning and policy course offered by the Public Policy and Administration (PPA) Department was revised using constructivist theory, exploratory and resource-based learning models and asynchronous learning networks with limited class "seat-time." Information technologies (IT) were an integral component in both teaching and learning processes. The Learning Productivity Grant requirements stressed faculty collaboration with an emphasis on decreasing student "seat-time" by using technology. Additionally, the course curriculum was internationalized. The case study describes the project and instructional design features and analyzes learning outcomes for student and faculty participants in relationship to relevant research and theory. Recommendations for carrying out future enhancements are presented.

The course concept and design were initiated by two faculty members, one from the PPA Department and the

other from the University Library. While other faculty at the University have implemented and continue to develop curriculum incorporating information technology, the PPA course was different from these, emphasizing collaboration of teaching and library information faculty, the exploratory and constructivist nature of the course, and the use of information technology immersion.

There are other examples of "team teaching," collaboration among teaching and library faculty, and course integrated library instruction; but usually these efforts involve bibliographic instruction, research skills, and/or developing collections in a content area (Daughtery & Carter, 1997; Gowler, 1995; Isbell & Broaddus, 1995; Judd, 1996; Lawson & Nicoll, 1994; and Wallach & McCann, 1996). The PPA course differed from these examples, being a content course in which information technology use was the primary teaching and learning tool. Faculty served as consultants, coaches, and facilitators to the students. A self-directed, exploratory, resource-based learning model was used. Within this student-directed learning environment, students also had access to both local and global technical experts and specialist consultants via electronic communities (i.e., e-mail, email distribution lists, World Wide Web (WWW) sources, etc.).

Future iterations of this course will benefit from the lessons learned and experience acquired by course designers. Course design elements and experiences are significant, allowing transferability to other disciplines and courses. Four key components guide the organization of the case study. These components include: (a) collaboration, (b) constructivist learning theory, exploratory and resource-based learning strategies, (c) integrated information technology immersion, and (d) electronic communities.

Following is a discussion of relevant definitions and pertinent literature, course features, student and faculty learning outcomes from each of the component areas, analysis, and recommendations for future enhancements.

DEFINITIONS & LITERATURE REVIEW

Collaborative Models

Promoting a team approach to the delivery of instruction was an important Learning Productivity Grant objective. Technology provides many needs and opportunities for this type of collaboration (Berge, 1997). Davis (1995) argues that interdisciplinary courses, using varying teaching strategies, represent the best places to learn the skills of information retrieval, analysis, synthesis and the application of learned knowledge. Similarly, information-based technological strategies increase the need for cooperation among both discipline and library-information faculty (DeSieno, 1995). Kuhlthau, in her "Concept of a Zone of Intervention..." (1996), concludes that more collaboration is needed by information professionals in the workplace, especially in light of new and changing information technologies. Research from the Cognition and Technology Group at Vanderbilt (CTGV) shows the importance of interdisciplinary Communication (Lin et al., 1995). Further, the CTGV and DeSieno reports identify the importance of learning, collaboration, and creative community design when utilizing IT and the need for administrative and funding support. Several reports identify the need and opportunities for instructor, librarian/information, and computing specialist, collaboration on course design and delivery (Blandy & Libutti, 1995; Palmer, 1996; Pask & Snow, 1995; and Rader, 1995).

Two examples of broad "collaborative or learning communities" include the Information Arcade (IA) at the University of Iowa and the University of Washington's UWired program (University of Iowa Libraries, 1996; University of Washington, 1996). The Information Arcade offers a collaborative teaching environment where information specialists, graduate assistants, and faculty all teach using new information technologies (Lowry, 1994). The University of Washington's UWired program is a collaborative project among teaching faculty, information resource personnel, and students to assist with information technology resources related to content courses (Pask & Snow, 1995; University of Washington, 1996).

Collaborative and interdisciplinary courses can promote real and applied learning experiences using varied information resources, viewpoints, and instructional methods (Davis, 1995). Students need problem-based, applicable and authentic experiences, especially in professional programs such as health services administration. The PPA course designers purposed to achieve real problem-based, resource-based learning in a collaborative venture.

Constructivist Theory and REALs


10/28/2003
There are three basic characteristics common to constructivist theory.

Knowledge is not a product to be accumulated but an active process in which the learner attempts to make sense out of the world.

People conditionalize their knowledge in personal ways . . . (Gurney, 1989 in Grabinger, 1996, p. 669). That is, they acquire knowledge in forms that enable them to use that knowledge later (Bransford et al., 1990, in Grabinger, p. 669).

The construction of knowledge is based on the collaboration and social negotiation of meaning. Common understandings and shared meanings are developed through interaction among peers and teachers. (Grabinger, 1996, pp. 669-670)

Collins, Beranek, & Newman (1996) compare constructivist and objectivist theory. "In contrast to the instructional-delivery [objectivist] view, the constructivist view leads to an emphasis on learning rather than teaching, and on facilitative environments rather than instructional goals" (p. 1). There are extremes of both objectivist and constructivist learning theories. Even theorists and instructional designers disagree on constructivist definitions and the value of constructivism in learning (Dick, 1992, p. 97; Duffy & Cunningham, 1996; Duffy & Jonassen, 1992). However, there seems to be greater agreement regarding what type of content areas are best suited for constructivist environments. Ill structured domains, requiring higher level, complex, real-world learning lend themselves to the constructivist methodologies (Spiro, Feltovich, Jacobson, & Coulson, 1992, p. 122). The PPA health services policies and planning course, with its international component, fits this pattern.

Although health care planners/practitioners need basic knowledge of health laws, policies, diseases, and health care planning, there are many dynamic and complex variables impacting health care, particularly on a global basis. Policy implementation, local health care delivery systems and practices (or lack thereof), environmental issues, socio-economic characteristics, cultural values, emergency measures, and crisis management are complex, sometimes presenting ill-defined forces which the practitioner must address. Learning even the basics health care planning in one country or state is not completely or directly transferable to another area. However, "[a]nchored instruction . . . that reflects realistic, complex, [and] ill-structured situations" (Dunlap & Grabinger, 1996b, p. 74) provides the learner with methods and skills of researching, analyzing, synthesizing, and evaluating relevant information that are practical in any situation. These higher level cognitive skills are emphasized in a constructivist environment and are adaptable to health care planning and policy learning processes (Duffy & Cunningham, 1996; Spiro et al., 1992).

Honebein (1996) summarizes "seven pedagogical goals" of constructivist, learner-centered environments.

1. Provide experience with the knowledge construction process [student responsibility for learning].
2. Provide experience in and appreciation for multiple perspectives [viewpoints and problem-solving].
3. Embed learning in realistic and relevant contexts [authentic learning tasks].
4. Encourage ownership and voice in the learning process [student centered with teacher as consultant].
5. Embed learning in social experience [encourage collaboration].
6. Encourage the use of multiple modes of representation [different mediums].
7. Encourage self-awareness of the knowledge construction process [reflection]. (pp. 11-12)

Although a course can be learner-centered, this does not insure that students will automatically have the motivation, responsibility, attitudes, or skills to be self-regulating and active learners. "Rich environments for active learning" or REALs are constructivist based and designed to encourage student responsibility and motivation (Dunlap & Grabinger, 1996a, p. 228). Grabinger & Dunlap (1996) review the elements of REALs.

- [REALs] encourage student responsibility, decision making, and intentional learning in an atmosphere of collaboration among students and teachers;
- promote study and investigation within meaningful, authentic, and information-rich contexts; and
- utilize participation in activities that promote high-level thinking processes, including problem solving, experimentation, original creations, discussion, and examination of topics from multiple perspectives (p. 212).

In looking at the PPA case, many of the constructivist pedagogical goals and REAL aspects were accomplished,
but the areas of discussion, group problem-solving, and collaboration seemed less prominent than expected although opportunities were presented. The PPA course content and structure are analyzed in this context.

Discussions by Duffy & Cunningham (1996) and Duffy & Jonassen (1992) explain constructivist historical and current viewpoints and the application of constructivist learning theories and models in a technological context. Constructivism emphasizes the importance of access to information as the learner "actively transform[s] information using "knowledge building strategies" and constructs knowledge (Morrison & Collins, 1995, pp. 42-44; Moore, 1997; Morris, 1994). Kuhlthau's (1993) research also indicates that the constructivist theory is intricately related to information seeking behavior.

Exploratory/Discovery and Resource-Based Learning

Exploratory learning, or discovery learning, is "a learning situation in which the principal content of what is to be learned is not given but must be independently discerned by the learner" (Houston, 1995, p. 86). More generally, "... discovery learning can be applied to any learning environment in which the student is actively involved in problem solving" (Bruner, 1961; Duffy & Cunningham, 1996, pp. 182). The terms 'discovery' and 'exploratory' have sometimes been used to mean discovery of "prespecified knowledge" (Duffy & Bednar, 1992; Duffy & Cunningham, 1996). This interpretation negates, in part or in whole, the constructivist premise that knowledge is built or developed by the learner rather than having prespecified knowledge transmitted to and received by the learner. However, Duffy & Cunningham offer a more apt explanation.

An alternative view of discovery is to think of it in terms of "invention," a personal construction, rather than as a discovery of what exists. From this perspective, we take as the goal of instruction not the acquisition of a specific, well-defined bit of content but rather the ability to learn in a content domain (p. 182).

Neither constructivist theory nor exploratory learning excludes the review and revision of one's understanding in the context of a wider learning community. Rather, they "require the testing and revision of the knowledge being built" (Duffy & Bednar, 1992, p. 129). Further, while "... discovery [or exploratory] learning tasks" are well suited to and compatible with constructivist theory (Jonassen, 1992, p. 138) and constructivist theory and exploratory learning are both student-centered, the two are not the same (Duffy & Bednar, 1992, p. 131). Discovery or exploratory learning is an instructional method or tool useful in constructivist "philosophy" environments (Wilson, 1997, p. 65).

"Resource-based learning can be explained as a learning mode in which the student learns from his or her own interaction with a wide range of learning resources rather than from class exposition" (Brevik as cited in Rakes, 1996, p. 52). Resource-based strategies are effective in constructivist and exploratory models. Rakes (1996) examines resource based learning, the inquiry training model of Suchman (1962), and Internet/information literacy. Suchman argues "that students learn best when presented with a problem or question of genuine interest" (in Rakes, 1996, p. 53).

While engaged in this exploratory and resource-based environment, students need guidance in their research, information synthesizing, and knowledge building. Two methods, scaffolding and coaching, were utilized in the PPA course. Scaffolding is designed to get students through more complex tasks with as much support as they need, but no more... Scaffolding is the support given to students as they carry out a task... Coaching provides focused help at critical times and only as much help as is needed (Collins et al., 1996, pp. 8-9).

Integrated Information Technology Immersion

Integrated information technology immersion allows students to learn and master a wide variety of information technologies as IT tools and resources are used—that is, as students are "immersed" in IT through exploratory learning. Similar to immersion programs for language acquisition, the PPA course was taught predominantly in IT environment so that IT skills would be acquired along with content expertise. IT immersion provides for individual student needs and knowledge levels by offering instruction and consultation as needed, with a variety of tools, in a distributed learning environment (Oblinger & Maruyama, 1996). Also, it is proposed that student IT literacy is best achieved when information skills are taught as an integral part of the curriculum (Kohl, 1995).

According to Kohl (1995), the primary goal for library/information instruction and providers should be to create self-sufficient information users. Information technology must be integrated adequately into the curriculum to

Technical barriers, time in learning information skills, and anxiety/frustration are common to students in information technology dependent courses (Creed, 1997; Fowell & Levy, 1995; Schrum, 1995; Varner et al., 1996). Students and/or instructors familiar with more objectivist learning environments may expect integrated information technology to be "intuitively easy" or "to be read in a linear fashion like text . . . , and to memorize" rather than to explore (Tessmer, 1996, p. 122).

Asynchronous Communication

Asynchronous communication means that "parties are not online at the same time" (Burgstahler & Swift, 1996). Asynchronous learning provides point-of-use interactivity rather than "real-time" synchronous communication (Mayadas, 1987). Mayadas describes asynchronous learning networks (ALNs) as:

self-study techniques with asynchronous interactivity to create environments in which learners can access remote learning resources asynchronously . . . [enlisting] dynamic resources such as other students, outside experts, or the instructor, or more static resources such as assignments, course notes, . . . libraries, . . . databases, spreadsheets, or even software-generated simulations (p. 212).

Asynchronous communication provides efficiencies, especially with groups which are geographically and physically separated (e.g., in different time zones, etc.). Additionally, in a learner-directed constructivist environment, asynchronous communication emphasizes learner independence.


This integration is more than an academic exercise since information technology skills are an important part of professional work (Hug, 1997). Stivers, Betley & Meccouri (1995) provide an applicable scenario of a health educator/professional's daily use and integration of IT applicable to PPA students. Similarly, the PPA course designers wanted students to acquire information skills useful in the health care administration and public administration fields (Stuart & Hutto, 1996).

Electronic Communities

Electronic communities are described in various terms including: networked communities, electronic learning communities, online forums, group and/or one-to-one computer-mediated communications, etc. For purposes of the present case study, a definition provided for computer mediated communication by Kaye (1991) is germane:

The use of computers and computer networks as communication tools by people who are collaborating with each other to achieve a shared goal, which do not require the physical presence or co-location of participants, and which can provide a forum for continuous communication free of time constraints (p. 5).

Examples of electronic communities are cited in Burgstahler & Swift (1996) demonstrated by means of [electronic] conferencing, e-mail, interactive messaging, email discussion lists, information databases, Web sites, computer-assisted instruction (CAI), project-based computer instruction, student mentoring, tutoring, and collaboration via


10/28/2003
technology, interactive chats, and computer-based simulations and tutorials (Berge & Collins as cited in Burgstahler & Swift, 1996).

The use of electronic communities and expanded connectivity offers multiple knowledge benefits to learners and the instructional environment.

- Use of expanded electronic communities mirrors constructivist learning theory during the information search process. Kuhlthau (1997) writes "A theory for creating environments for learning in digital libraries [and information search processes]. . . build[s] on the basic concepts in the constructivist approach of acting and reflecting, feeling and formulating, predicting and choosing, interpreting and creating" (p. 723). The actual information search process assists learners in the construction of knowledge —seeking better ways to formulate ideas, answer questions, and hone "metacognitive" skills (i.e. "mental processes we use to monitor and regulate our own learning") (Flavell as cited in Reeves & Okey, 1996, p. 199).

- Use of expanded electronic communities also supports rich environments for active learning (REALs), putting the student at the center of learning. The information search process required in IT immersion or any electronic information seeking behavior similarly puts the student at the center of the learning environment.

- To be effective information technology users, learners must acquire critical thinking skills. These are the same skills needed and acquired in constructivist, exploratory, and resource-based environments. "Using the Internet as well as other information resources requires the development of conceptual frameworks to access, process, and utilize the mass of information available" (Hug, 1997, p. 211), requiring "focusing . . . information-gathering . . . remembering . . . organizing . . . analyzing . . . evaluating . . . generating . . . and integrating skills" (Marzano et al. as cited in Hug, 1997, p. 211).

- Electronic communities provide expanded connections to specialists, faculty, and students throughout the world. The curriculum can be internationalized. The community can also provide authentic "apprentice or mentoring" situations, allowing a mechanism for information exchange and knowledge construction within a larger learning community. Fowell & Levy (1995) rightly predict that computer-mediated communication is useful for more than just distance learning environments and that it is adaptable to on-campus courses for its flexibility and connections to outside electronic communities and authorities. Various authors including Heinich, Molenda, Russell & Smaldino (as cited in Rakes, 1996) and Morrison & Collins (1995) echo the benefits of broadening student interaction with experts outside the classroom.

- Use of expanded electronic communities provides learners with practical information competency skills for professional and "life-long learning." Electronic information searching allows enhanced effectiveness and efficiency in the research process, particularly with interdisciplinary subjects (Bartolo & Smith as cited in Walser, 1996). Likewise, online facilitated learning can provide enhancements not found in more classroom settings (Hiltz, Wells, & Harasim et al. as cited in Brooks, 1997, p. 27).


COURSE EXPECTATIONS

The significance of learning outcomes in the PPA course can be better understood in the context of course objectives and goals, design, processes, and the assigned course project.

Course Objectives

Students enrolled in the PPA course had four major course objectives. These included (a) examining and understanding factors impacting health planning and policy, (b) developing strategic planning skills within the health care system, (c) incorporating global health care issues within the context of health planning, and (d) using and mastering a variety of information technologies.

Design Components
To help students meet course objectives, eight major design components were integrated into the course. These included:

- (a) Instructor-established structural expectations provided at the beginning of the course;
- (b) IT immersion;
- (c) initial and on-going training in IT tools and resources;
- (d) available consultation with instructor, librarian, and student computer lab assistant;
- (e) linkages with local and international electronic learning communities set up prior to the course;
- (f) a self-directed learning project focusing on emerging diseases;
- (g) reduced "in-class seat time" with only three required sessions, optional information technology sessions, and individual consultation as needed; and
- (h) grading by contract in which students select the level of expectation to attain particular grades.

Information Technologies

Seven information technologies were used as part of the IT-immersion process. Information technologies included e-mail, listservs and newsgroups, library indexing and full-text databases, electronic journals, Web resources and search tools, presentation programs, and a health policy simulation program. These information technologies provided access to "electronic communities."

Course Project

While students had various assignments and readings, the largest portion of the course involved student exploratory projects on emerging and reemerging diseases. This provided students with a resource-based learning assignment. The emerging/reemerging disease project had four major requirements. Students compared and contrasted related health policies in the United States, another country, and parallel governmental units for an emerging or reemerging disease. As an example, one student did a project on tuberculosis in the United States, Great Britain, and the local county area. Secondly, students were to communicate electronically with volunteer local and global specialists from the United States and other countries (e.g., Brazil, Australia, the Netherlands, and Haiti, among others). PPA course faculty recruited specialists through various listservs. These emerging disease specialists and epidemiologists were invited to serve as consultants to students. Students were encouraged to select "disease" topics and a country represented by one of the specialists' study areas. Next, students were required to use IT tools and resources, many of which were accessible from the PPA 618 Course Web Page (Moore, Alexander, & White, 1997) and the PPA 618 Web Resources Page (Alexander, 1997). Finally, students were asked to present their findings at the end of the course in oral presentations using electronic presentation tools. Students were also required to prepare journals of their technological travels.

METHODOLOGY

Measuring Outcomes

Learning outcomes were assessed through multiple measures. Measures were based primarily on course objectives met, course features which best facilitated participant learning, and student project/task assessment. This assessment was based on student and faculty evaluations, and reports of anecdotal experiences. An extensive feedback form was provided to student participants at the end of the course. The responses are reviewed within this article and summarized in Appendix A. Faculty members evaluated course outcomes and processes both separately and jointly. Their evaluations are based on answers to a number of questions and an inductive examination of what was said by all participants and colleagues. These evaluation questions included:

(a) What was learned as demonstrated by presentations, technological travel journals, comments, stories and observations, and how was it learned?

(b) How did consultation efforts impact outcome?

(c) What were the dimensions of the consultant approach in teaching?

(d) What did this type of exploration offer to the learning process?
(e) How prepared were students to use information technologies?

(f) How did integrating IT impact the learning process?

(g) How can the course design be improved?

(h) How can this design be used in other courses?

Limitations

The PPA course was a pilot project. The class size was small. Five students were enrolled. Increased enrollment would have captured a larger database from which to draw additional generalizable and applicable results. However, the small class size was a benefit to faculty by allowing the course to be conducted on a smaller, trial scale. This feature helped faculty work out problems and plan future administrative and logistic aspects more easily. Aware that this was an experimental/pilot class, students were willing to discuss issues involving course design. To accommodate the limited number of subjects participating, the analysis is presented in case study form.

LEARNING OUTCOMES

At the beginning, mid-point, and end of the course, learning outcomes were measured from both student and faculty perspectives through verbal and written feedback. Resultant learning outcomes are presented and analyzed in the following section according to the four course components of (a) collaboration, (b) learning theories and models, (c) integrated IT immersion, and (d) electronic communities.

Collaboration

Faculty collaboration was carried out on two fronts—during the instructional design phase and throughout the course as faculty served as facilitators and consultants to students. Students were asked about the observable impact of faculty collaboration.

Students observed that collaboration was a major emphasis of the course. The extent to which the teaching and library faculty collaborated in planning the course was evidenced in student responses. From both student and faculty perspectives, faculty were successful in integrating the subject content of the course (health planning and policy) with information technologies. Compared to other courses taught by one faculty member and based in a single discipline, students thought the course captured their interest and challenged them to think more than the other courses. Students found the collaboration of the instructor and information consultants helpful to them in meeting course objectives. Due to the reliance on exploratory and resource-based learning activities in a constructivist context, students saw, in real and practical terms, the value of collaboration.

Information technologies provide an opportunity for library and teaching faculty to combine expertise and resources to change, develop, augment, and enhance instructional course design. Collaboration of teaching and library-information faculty capitalizes on the content understanding and expertise of the professor and the productive use of information resources and technology by the librarian. Designers of instructional delivery will have many ideas, but they will be limited by time and expertise, able to implement only a portion of available initiatives. Some students lack the commensurate skill levels needed to apply particular IT to learning initiatives. Designing courses collaboratively and serving in consultation together, the instructor and library-information specialist provide help by drawing from varying perspectives, skills, and knowledge. The course designers' sharing knowledge—health planning and information technology—was the basis for melding these two areas into an interdisciplinary learning approach. Prior conversations between instructor and consultants suggested the direction of assignments, the availability of resources, the presentation plan, and inter-relationship of course content and research.

Faculty collaboration offers an excellent opportunity to deal with immediate student issues involving content, research, and information technology matters. This is best described as "corporate consultation" (or collaborative coaching). As an example, a student discussing a project at the mid-term evaluation session was directed by the instructor to a specific historical incident. The library-information consultant, concurrently, was able to suggest


10/28/2003
sources for finding this information. In another instance, the instructor suggested applicable interest groups and associations. The library-information consultant was able to suggest a relevant source which was "The Course Resoure Page. This is different from other teaching environments where instruction and student research activities take place in isolation. The student's information need is presented and is handled more cohesively in a collaborative effort (Fuller, 1993; Kuhlthau, 1996). Using the course listserve, student-posed issues can be addressed from different perspectives by instructor, information and computer consultants, and local/global specialists. Additional class meetings with both the instructor and library-information consultant might have enhanced the corporate consultation aspect without de-emphasizing the exploratory nature of assignments. A suitable balance is needed.

Technical difficulties can be immediate and ongoing barriers to student learning as reported by participating PPA students. The library information and computer-lab student consultants were added for this very reason: to serve as safety nets during students' information travels (Kuhlthau, 1996). The consultants served as coaches, providing scaffolding throughout the learning process.

Learning Theories and Models

Students favored the exploratory learning environment. This environment allowed the student to work at his/her own pace. When asked if they would recommend this course to others and/or be interested in taking another course with this same format, all responded in the affirmative. The instructional environment captured student interest and challenged them. Student feedback suggested that many of the course components were very helpful or helpful in meeting course objectives. The components related to self-directed learning, constructivist models, the information/resource-based and exploratory project, and limited in-class seat time were some of the more helpful features. Self-directed learning, the constructivist model, and exploratory features received the most favorable feedback.

A basic question asked of students was to what extent did the course project impact learning? Students found the emerging disease project helpful to them in examining, exploring, and understanding the sociopolitical, economic and legal factors of health and human services planning and policy in regional, national, and international arenas. In terms of the course project's impact on student use and mastery of IT, responses were favorable but less so than in the earlier "meeting course objectives" content questions. IT immersion had important and practical implications for students completing the course project, but the course project did not necessarily have equal impact on IT learning.

The information resource-based nature of the course was considered helpful but not at the level of other components. In regard to meeting course objectives, the information resource-based project vs. traditional course lectures, exams, etc., was considered helpful to very helpful by the students. Student comments attest to the amount of time, and work required with this type of course project.

The limitation of required "in class" seat time vs. traditional course class time, as a facet of meeting course objectives, received the same evaluation as the project-based feature (helpful to very helpful). However, of particular interest were students' verbal and written comments at the end of the course: increased class time and more structure would have enhanced their learning experience.

Course content and acquired skills were thought by students to have application for future course work and real world problem-solving. In particular, students commented that they were more confident in their research skills. All students thought the course would assist them in applying acquired skills in real work environments. Four out of five students felt the course would be very helpful in assisting them in completing their Public Policy and Administration culminating project.

Integrated Information Technology Immersion

Did students' immersion into IT improve their IT skill levels? The technical nature of the course, overall, was considered helpful by students, but not extremely so. Students commented that technical difficulties were a stumbling block. Problems included difficulties accessing information successfully from home through remote connections, accessing Web course page servers, technical issues using e-mail, and printing and downloading difficulties. Student IT skill varied appreciably and seems to have impacted the value of IT consultation assistance. Students evaluated the helpfulness of information technology assistance provided during the course.
and the relationship to meeting course objectives. Evaluations varied depending upon the student's initial skill level, but all found having a librarian as a consultant to be very helpful.

Students' perceptions of "time consumed with information technology" are significant and interesting. Students were asked to rank nine main activities related to the course in terms of time consumption. Results are shown in Figure 1. Responses varied depending on students' experience, but the results indicate that the process of acquiring new IT skills was, overall, the most time-consuming activity. On average, learning to use various IT tools was ranked as the most time consuming activity. Learning to use various electronic communication tools received a substantially high ranking in comparison to other areas. These time-consuming IT activities included learning to use tools such as library databases, full text sources, the library online catalog, full-text electronic journals, Internet resources, Web/Internet search tools, e-mail, listservs, newsgroups, and presentation tools. Learning to use IT took relatively more student time than researching information sources and gaining content knowledge. Students spent more time learning to use various information technology or presentation tools and/or communicating with information and computer consultants than in communicating with the instructor and content specialists.

Figure 1. Activities ranked most to least time consuming.

(a) Learning to use various information technology tools such as library databases, online catalog, full text electronic journals, Internet resources, and Web/Internet search tools.

(b) Preparing the final presentation.

(c) Completing assigned readings and other assignments including simulation program and newspaper editorial.

(d) Consulting electronic information resources including the Course Web page and the PPA 618 Information Resources page on emerging diseases.

(e) Learning to use various electronic communication tools such as e-mail, listservs, and newsgroups.

(f) Communicating and consulting with the library-information consultant and computer lab consultant.

(g) Communicating and consulting with the instructor, and local and global specialists.

(h) Attempting to gain access to electronic course information and resources from home or office (set up).

(i) Learning to use electronic presentation programs.

Although time consuming, students' IT skills improved in every area. Students were asked at the beginning and end of the course to note their skill level in using a variety of resources and information tools. IT skill areas included:

(a) World Wide Web/Internet browsers, (b) Web search tools (AltaVista(c), OpenText(c), etc.), (c) Library online catalog, (d) journal indexes, (e) Medline(c), (f) full-text sources, (g) electronic journals on the Web, (h) SimHealth (c) (simulation program), (i) VMS e-mail system, (j) listservs and newsgroups, (k) presentation programs such as PowerPoint(c) and Web publishing tools, (l) connecting to Streim Library resources from home, and (m) connecting to campus resources from home.

Skill improvement was significant in every area, even when students encountered technical difficulties. Initial student responses showed the areas which required concentrated IT instructional time. Orientation sessions were
geared to those needs. Figure 2 indicates students' IT skills most needed at the beginning of the course. At the end of the course, each student had some skill or high skill levels in every area (with the exception of connecting remotely to campus IT resources; some students did not have remote access and others experienced connectivity problems).

Figure 2. Most needed information technology skills at the beginning of the course by percentage of student responses.

80% PowerPoint(c)
80% Electronic-journals
80% Web search tools
80% Remote access to campus
80% Remote access to library
60% Web publishing
60% eMail distribution lists
40% E-mail

Using IT as a learning tool offered a number of benefits. The PPA 618 Course Resource Page was valuable in providing an instrument for pre selecting information resources and links for students. The page was also easily updated. Having a course web page provides a neat, clean way to coordinate the logistics of the course. Web and other information databases were applicable to each of the students' projects, allowing resource specificity and individual consultation as needed. Several times, "on-line" coaching or consultation by e-mail took place between the student and library-information consultant.

Electronic Communities

Students were given ample opportunities to "[explore] electronic communities" (Schrum, 1995, p. 5) through a variety of tools and "cyber spaces" including the Internet, World Wide Web, library and specialized information databases, listservs, and e-mail. The use of electronic communities is well suited to a student-centered learning model similar to the PPA course (Burgstahler & Swift, 1996). Electronic communities support individual, independent and group learning, exploration, and provide opportunities for student self-regulation and convenient access. Either or both asynchronous and synchronous communication modes could have been used (Romiszowski & Ravitz, 1997). However, for this project, course designers focused on asynchronous modes due to the characteristics and advantages of asynchronous communication. These include "[flexible] time independence, permit[ing] 24-hour access to other people and resources ... be[ing] more convenient for student [s] meeting work, family, and other responsibilities; [providing] self-paced learning; [and] allow[ing] time to [reflect] and compose responses [in a non threatening environment]" (Berge, 1997, 5; also Methods, n.d.).

Additionally, the purpose of the grant was to design asynchronous instructional opportunities and/or to use technologies to limit student "seat time" while emphasizing independent student-learning. Moving away from more traditional, time dependent learning models was the goal. Asynchronous communication, already a pervasive tool at the University and easily implemented, met the underlying project goals (Methods, n.d.). As a matter of comparison, and a down-side to this design decision, asynchronous modes may lack the "immediacy, excitement, http://jan.ucc.nau.edu/~iptc-j/1999/n1-2/alexander.html 10/28/2003
[and] interact[ivity]" of synchronous communication (Methods, n.d.). Additionally, asynchronous communication emphasizes "... self-paced learning ... [and, thus,] comes the responsibility of ... [students] to be self-motivated in their work habits" (Berge, 1997, p. 8) and to "select effective strategies." This, of course, is not always the case (Berge, 1997; Bourne, 1997; Romiszowski as cited in McKnight, Dillon, & Richardson, 1996, p. 628).

The WWW, Internet, library databases, and specialized information resources received the most use. E-mail was used a good deal on a one-to-one basis between faculty and student, but the listservs were utilized more by faculty. Students found the databases, Web connections, and resource pages useful. However, in spite of the existence of multiple technologies, electronic communities, and the IT immersion experience, these aspects did not, in and of themselves, seem to produce high levels of collaboration or community. Such community is developed more from the tasks assigned, group organizational structure, and participant responsibility than from the technology experience (Burgstahler & Swift, 1996; Riel & Levein, 1990). If anything, the IT experience, coupled with decreased class interaction, may have produced more student independence and less group or community interaction among students, faculty, and expert specialists. The feedback evaluation form provided to students did not address the issue of time spent collaborating individually with other students so the actual data regarding this issue is wanting. Lacking available data, students commented they found the use of e-mail helpful, but there seemed to be limited use of this IT in collaborative practice.

Contacting and soliciting global experts to participate as consultants to this course worked well. Within a few weeks after putting a "Global Experts Sought" message on several pertinent listservs, seven interested specialists were willing to participate. Only in a global WWW environment could this be done so efficiently and effectively. The instructor also recruited two local public health experts to act as consultants. Students, however, did not confine their information seeking to the list of recruited specialists. Other Internet search engines were used to identify experts in related fields. Consultation, especially with global experts, was acquired primarily through electronic community connections, e-mail, listservs, Web pages, and so forth. Some students found e-mail to be a useful means of accessing electronic communities and communicating with specialists. Others were disappointed either because the information requested did not exist, there was no response, or they were hampered by technical difficulties. Student evaluations varied widely in response to the question of value of electronic community consultation with local and global specialists and practitioners. As a whole, students did not find this aspect of the course as useful as other features.

Other Areas

Other components including the initial orientation, mid-term evaluation session, use of e-mail, and contract grading were considered very helpful to somewhat helpful but, generally, not as beneficial as the previous listed components.

Student Learning Assessment

The following observations and assessments concerning student learning are based on the instructor's experience teaching this course, the previous course iterations, and subsequent course iterations.

The underlying grant goals were "to promote ... new approaches to teaching and learning, particularly those that eliminate the rigid connection between academic credit and 'seat time' requirements ... [and to] reconceptualize" teaching and learning processes ... through creative applications of technology" (W. Barbour, personal communication, May 6, 1996). As designed, students in the PPA course were offered a new approach to teaching and learning. Compared to previous renditions of the course, students did not learn as much about the specifics of United States and state health policy. Rather, students expanded their conceptual framework and the cognitive and "knowledge construction" skills needed to "study" in the health policies and planning content area, as well as learning more about health planning on a global basis.

The course design and learning environment were intended to be learner centered with faculty facilitating students' self-directed learning, critical thinking acquisition, and IT and information processing/seeking skills. This environment requires student "self-regulated learning" (Brooks, 1997, p. 135), "learner-control" (Williams, 1996), and reliance on "intrinsic motivation" (Reeves & Okey, 1996, p. 199). Evidence of learning was assessed through a variety of means, other than by examination (e.g., project presentation, project outcomes, writing, technological travel journal, etc.) (Hudspeth, 1997; Jonassen, 1992).
At times, some students seemed to find the learner-directed, IT, and technical facets of the course to be barriers or at least frustrations with learning content. However, a number of the students excelled in this environment. Some students who had previously taken other more traditional PPA instructional-delivery courses demonstrated overall improvement in the quality of their work and substantial gains in learning outcomes. They sought and achieved more and performed better in the self-directed, exploratory, resource-based and IT intensive environment (BJ Moore, personal communication, 1997-1998). Tynjala (1998) also found similar results comparing constructivist and traditional learning environments. The specific factors which determined PPA students' academic gains deserve further research. Future comparative and independent assessments are needed to ascertain the relative importance of each factor. However, aspects that appeared to have the greatest impact on students' meeting course objectives and that "worked well" in course implementation have been added in subsequent PPA 618 sections.

ANALYSIS & RECOMMENDATIONS FOR ENHANCEMENTS

Students' understanding, analysis, synthesis and evaluation of health policies, exposure to IT and resource immersion, professional interaction within learning communities, and applied research skills were important for successful completion of the PPA course. These skills and competencies have direct application to other courses and professional pursuits. However, in assessing the outcomes in connection with theoretical concepts and research, several alterations would improve this course design. These changes include issues of structure, increased electronic interactivity, collaborative learning tasks in the electronic environment, increased class time for content and information technology guidance, and logistical/course management. In addition to course re-design, the issues of information competency and IT support are relevant to the larger academic community.

Structure

Moving from an instructional-delivery mode to a constructivist model highlights issues of structure. Perkins (1992) discusses the problem.

Constructivist learning situations throw students suddenly and almost wholly on their own managerial resources. They either "hack it" or they don't, and many are so unused to managing tasks themselves that they fend poorly. The high cognitive complexity of many constructivist learning settings of course exacerbates the problem . . . . (p. 163)

This, in part, describes the PPA course situation. While Perkins goes on to suggest that scaffolding and coaching are means of solving task management issues (1992, p. 163), it appears from the evaluations and observations that the PPA scaffolding and coaching provided were either not sufficient for all cases or not fully used. Kuhlthau (1996) and Romiszowski & Ravitz (1997) identify similar patterns. Although opportunities were presented, the facets of discussion and problem solving in a collaborative environment were underutilized. In analyzing Grabinger & Dunlaps' (1996, pp. 213-238) guidelines for achieving REALs, several tools would have enhanced the coaching and scaffolding functions. These include: questioning, examples and modeling of projects, and group learning through collaborative work.

Students found the exploratory nature of the course useful; they also commented that additional structure would help provide more guidance and focus to their projects. The need for structure could also have been met by the addition of more programmed instruction and more (but shorter) assignments. One example would have been to give students the task of researching mini-projects first before doing their major projects. Several smaller based assignments would have helped in three areas—increasing and enhancing communications and collaboration within the electronic community, giving students some practical IT work before the final major project, and providing more frequent assessment opportunities (Barrows & Myers as cited in Savery & Duffy, 1995, p. 35, Figure 1; Cyr, 1996; Dunlap & Grabinger, 1996a; Hudspeth, 1997). Asking the global and local specialists for specific research questions would have provided an excellent experiential and problem-based environment in which students could use information resources and technology and understand the practical issues of public health research and policy. These types of changes would have provided more structure and opportunity for group learning and revision, important aspects of constructivist theory.

Increased Electronic Interactivity

While the PPA electronic communities were designed to provide a collaborative workspace, information
resources, a scholarly support community, and convenient asynchronous access, several key ingredients were missing. An evaluation of key elements based on research findings of effective electronic community implementation follows.


Need and Motivation

Electronic communities must meet the needs of their users and provide adequate motivation. Effective electronic networks are characterized by communities of:

...people with well-established relationships looking for new ways to work together or of strangers with a common commitment to a specific task...[having a] mutually shared goal or well-specified task... meeting... participants' needs...[with] regular patterns of accessing mail...[that provide] "community" pressure to read and respond to mail regularly and in a timely manner... (Burgstahler & Swift’s, 1996, n.p.).

While students had a common goal in terms of completing course projects, assignments, etc., the tasks were not specifically group or common tasks. Many of these students were together in other classroom-based courses as well. The designers believe this provided another communication channel for students, thereby limiting the amount of electronic discussion needed. The structure of assignments and resources did not require frequent use of listserv or e-mail connections by students and, thus, there was little motivation to interact electronically. The question is then raised as to whether needs of the participants were met with these communication technologies and if not, why? (O’Shea, Kimmel, & Novemsky as cited in Burgstahler & Swift, 1996). Issues involving organization, access, and facilitation are key.

Organization

Electronic community organization should provide: collaboration and mutual support among members... openness...and informality of communication...group structure (rather than individual to-individual communication)...[and an organization] lacking a social or organizational hierarchy... (Gundry, 1991, in Burgstahler & Swift, 1996, n.p.)

Students did not appear to test their ideas among the class learning community as a group or, at least, in an electronic forum. Students "entered the learning community" but with limited collaborative dialogue. Without intending it, there may actually have been a hierarchical structure in the electronic community causing students' reluctance to converse with global and local experts: experienced specialists in the field of public health issues. Students were counseled to pose "well thought out questions" to specialists based on students' preliminary research. While each student received information concerning the specialists, experts and students were not first introduced in an electronic forum. No initial online interactive clues from specialists were provided to students so that they might gauge the type of response their questions and viewpoints would be given. There was no "testing the waters." Written communication apprehension may have limited online communication (Fishman as cited in Methods, n.d.).

Access

Necessary factors for useful network cultures include "[e]asy and efficient access to technology...,[providing] a reliable system...[with] well-trained users..." (Burgstahler & Swift, 1996, n.p.)

Technical problems may have been too big a hurdle for some students to overcome in terms of using e-mail and/or listservs in a manner that was time efficient for them. As stated earlier, several students voiced frustration with technical issues. The PPA course was not advertised as a distance learning course, but the expectation was there because of the IT and limited class time components. Because of varying equipment, software, and technical knowledge, students found the remote-access issues problematic. This accounted for a good deal of students' initial start-up work and time. Overall (except for a few examples of file transfer problems), the
information database part of the electronic learning community seemed to be more easily accessible, providing 
less complexity and uncertainty (Kuhlthau, 1996). However, the parts of the electronic community that would 
collaborative revision and dialogue, those of e-mail and listservs, were more difficult to use or appeared less 
accessible to students. Since the course concluded, the barriers to using electronic communication for course 
work have decreased and will continue to decrease as e-mail for course work becomes more common (Elasmar & 
Carter, 1996).

Facilitation

"[A] facilitator or moderator to encourage group interaction . . . " is also useful for stimulating and guiding 
discussion in electronic communities (Burgstahler & Swift, 1996, n.p.). While the PPA course faculty and 
consultants served as facilitators, a more structured, proactive, and sustained facilitative environment may have 
increased communication (Harris, O'Bryan & Rotenberg, 1996; Kimball, 1995; Riel & Levin, 1990, p. 166).

Interactivity Enhancements

While some students were successful in their electronic interactions, overall the “electronic community” potential 
appeared underutilized. This problem is reflected in other case studies (e.g., Davis & Holt, 1998). In the PPA 
course, there were several possible contributing factors to this problem including student delay in selecting topics 
and countries, lack of confidence in communicating with experts and/or in doing so electronically, and some 
technical barriers. The following paragraphs outline suggested enhancements to interactivity.

The delay issue would be solved by mandating that students turn in their grade contracts and selected topics by 
the first or second week or be forced to drop the course. The delay in students’ selecting country/topics left 
experts in the lurch and contributed to less than successful electronic discussion.

As stated earlier, encouraging electronic interaction between student and instructor on some smaller projects 
would provide a less threatening environment in which to practice collaboration electronically and would facilitate 
student and instructor interaction (Lewis, Treves, & Shaindlin, 1997). As an example, the class might view, 
together or apart, a video on emerging diseases or present a reading where students, given a scenario on an 
emerging disease, would have to address the short- and long-term policy issues (Desk, 1995). Another feature 
increasingly used for asynchronous communication includes having students respond to readings or questions 
posted to a course Web page (Brooks, 1997, p. 96). In the PPA course example, having students contribute to the 
knowledge base as they make their technological journeys would assist other students, make the research 
process more interactive and provide additional need to communicate electronically (Tweedale, Nichols, Smith, & 
Trevor 1995). Students might also save and post their e-mail transactions with specialists. This could be 
programmed into the course Web page so that students would input information, making it immediately available 
(Jonassen, Myers, & McKillop, 1996, p. 94).

Finally, students’ learning and electronic communication skills would be enhanced by the requirement that they 
subscribe to a related professional online conference. Conferences and listservs were provided, but requiring 
students to subscribe and/or to participate a minimum number of times (Wells as cited in Burgstahler & Swift, 
1996) would give them a better sense of this information technology. Incorporating additional epidemiologic 
statistical analysis tools might also stimulate student learning and interaction.

Electronic Communities and Collaborative Learning

There appear to be three major factors underlying the insufficient use of collaborative and group learning in PPA 
electronic communities. These factors include time, isolation and independence, and the need for integrating 
collaborative learning tasks.

Some students delayed selecting their projects, thereby limiting their time to carry on significant dialogue with 
specialists. University courses are taught in a ten-week quarter, also limiting the time for establishing meaningful 
interaction and collaboration.

In the 1998, researchers from the Carnegie Mellon University’s HomeNet project published the article “Internet 
Paradox: A Social Technology That Reduces Social Involvement and Psychological Well-Being?” (Kraut et al., 
1998). The study reported that “using the Internet seems to cause isolation . . . “ replacing human, face-to-face

interactions (Carnegie Mellon Institute, 1998, n.p.). While the present PPA case was not a study in social isolation, it appears that students relied more heavily on IT access to databases and Web sites than communication tools and/or electronic dialogue and group learning opportunities. When in-class seat time is decreased, it may be misguided to theorize that students will find shared experiences, assistance, dialogue, and interdependence in an electronic environment such as that found on a listserv. More emphasis on revision of ideas, collaboration, and dialogue would have enhanced the learning experience.

Online revision of ideas and collaborative learning tasks were not specifically designed into the course. The "individual" project environment did not lend itself to "community/group dialogue" or community "productive learning conversations" (Morrison and Collins, 1995, p. 39). Collaboration would have been more effective had all the students been working on one disease project from different country perspectives or had experts been asked to pose specific questions to be researched, analyzed, and solved. Using problem-based strategies, the instructor and consultant could have provided more structure to student work and created a more substantial reason to collaborate within the electronic community.

Increased Class Time

While students appreciated having limited in-class seat time, class or group time was also an aspect missed by students. Students suggested that class meetings held once every week or every other week would have improved learning. During the first orientation class session, approximately two hours were spent on discussing the course, requirements, and syllabi. Another two hours were devoted to IT instruction. Follow up IT sessions were provided; but, in retrospect, more time at the first session should have been devoted to IT instruction, and use. In reality, if five to six hours of IT instruction had been provided the first day, students would have been better equipped to deal with barriers. "One of the most significant factors of successful networks is well-trained users. Participants' inability to learn the system due to inadequate training has been cited as a primary reason for network failure" (O'Shea, Kimmel, & Novemsky as cited in Burgstahler & Swift, 1996, n.p.). The technical difficulties encountered by some students seemed to present barriers in "electronic community" discussions. More required class time and IT instruction may have helped students in this area, providing more direction and technical problem-solving.

Further, the introduction of selected synchronous electronic communication modalities may benefit this aspect of the course in the future. Synchronous communication might be used to add more "group time" for brainstorming, etc., providing students with the convenience of not coming to campus but still offering additional class interaction (Berge, 1997, p. 9).

Logistics

The PPA course was a pilot project. Course designers and administrators were aware that this was an experiment. Part of the trial was to discover problems and find ways of overcoming them to enhance future course designs. This trial run gave designers an opportunity to evaluate the logistical aspects and work out problems. The following outlines these management issues.

Handling course management logistics differently would have improved efficiencies. It would have saved time, in the long run, to have all administrative student information input and registered automatically by the student. This would include automatically registering students for e mail, listservs, and conferences from the course Web page. The information would then have been sent directly to support-departments such as the campus computer center (see also Khan, 1997 and Brooks, 1997).

Course Web page planning was done by the course designers, but the actual hypertext markup language (HTML) work was done by the PPA computer student consultant. This limited the instructor's and information consultant's access to modify the Web page. In the short-term, the instructor and information consultant had no need for higher level HTML and forms programming, but direct access by consultant and instructor would have been useful. The Course Resource Page, on the other hand, was designed and controlled directly by the library-information consultant. Additions and modifications were added throughout the course with shortened turnaround times.

As mentioned before, varying equipment, software, technical problems, and student skill levels caused frustration for some of the participants. Course designers should spend more time in solving connectivity issues and
"glitches" prior to the course beginning and/or provide check-out laptop computers with appropriate software and hardware capabilities. Students would subscribe to an Internet provider for access. The course designers had discussed this possibility, but more funding and planning time would have been required. Since course completion, there have been a number of changes. Increasing numbers of students have off-campus Internet access. The library-information consultant has had more experience with technical questions and is better able to assist students. While not all technical problems can be eliminated, changes in the campus technological infrastructure and IT support programs have solved many of the technical issues for students.

Information Competency and University Support

In addition to proposing enhancements to this course, two other important areas, applicable to all universities and the wider academic community, should be highlighted: information competency and IT support. Universities are dealing with questions concerning information competency (IC) (Grassian, 1997). The issues revolves around various questions of IC's place in the curriculum (e.g., integration, delivery methods, teaching responsibility, etc.). There are many positives to IC curriculum integration as demonstrated in this case study. However, if the PPA course is any indication, there are two basic factors to consider: 1) students need practical and applicable IT instruction and guidance in the learning process, and 2) acquiring new IT skills is a time consuming task for students. Acquiring IT skills can be so time consuming that it may actually overshadow some content learning functions. But students without IT skills will encounter even greater difficulties in any learning environment, whether it be constructivist- or instructional-delivery based. Finally, if new modes of teaching and learning are to be implemented successfully using information technologies, information and IT infrastructure, resources, personnel, user support, and training must be at a level to support student needs and faculty initiatives. Universities need to see IC and IT skills as priorities for all student learning.

SUMMARY

In summary, IT used in an exploratory/constructivist model provides excellent opportunities for collaboration between teaching and library information faculty. However, students still require additional structure, coaching, and class time. Students will use IT when it is integrated within a course, and IT immersion results in improved student IT skills, in spite of technical barriers or initial knowledge levels. The possibilities and uses for electronic learning communities are limitless, provided care is taken in promoting collaboration, and presenting and structuring assignments around these communities.

REFERENCES


Association, Indianapolis, IN. (ERIC Document Reproduction Service No. ED 385 887)


Harris, J., O'Bryan, E., & Rotenberg, L. (1996, October). It's a simple idea, but it's not easy to do! Learning and Leading With Technology, 24, 53-57.


Palmer, C. L. (1996, Fall). Information work at the boundaries of science: Linking library services to research


10/28/2003
practices. Library Trends, 45, 165-191.


Appendix A. PPA 618 course feedback questions, responses, and percentages.

1. To what extent did the course project on emerging diseases help you

a. . . . examine and understand the sociopolitical, economic and legal factors of health and human services planning and policy in regional, national, and international arenas?

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 3 (60%) 2 (40%)

b. . . . use and master a variety of information technologies?

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 2 (40%) 3 (60%)

2. To what extent did you find the following course components helpful in meeting course objectives?

a. Structural expectations provided at orientation session.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 2 (40%) 2 (40%) 1 (20%)

b. Orientation on using email.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 3 (60%) 1 (20%) 1 (20%)
c. Orientation on electronic information resources.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 3 (60%) 1 (20%) 1 (20%)

d. Mid-term evaluation, problem-solving, and discussion session.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 2 (40%) 3 (60%)

e. Flexible learning and research environment.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 4 (80%) 1 (20%)

f. Self directed learning.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 4 (80%) 1 (20%)

g. Exploratory nature of course work and project.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 4 (80%) 1 (20%)

h. Information resource-based project versus traditional course lectures, exams, etc.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 3 (60%) 2 (40%)

i. Limited required "in class" seat time versus traditional course class time.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 3 (60%) 2 (40%)

j. Instructor as consultant and facilitator.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 4 (80%) 1 (20%)

k. Librarian information consultant.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 5 (100%)

l. Computer lab student consultant.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 3 (60%) 1 (20%) 1 (20%)

m. Instructor and information consultants collaboration.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 3 (60%) 1 (20%) 1 (20%)

n. Technological nature of the course.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 1 (20%) 3 (60%) 1 (20%)

o. Use of email communication links.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 2 (40%) 3 (60%)

p. Consultation with local specialists and practitioners.
Very Helpful Helpful Somewhat Helpful Almost No Help No Help 2 (40%) 1 (20%) 1 (20%) 1 (20%) 1 (20%)

q. Consultation with global specialists and practitioners.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 2 (40%) 1 (20%) 2 (40%)

r. Contract grading.

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 2 (40%) 3 (60%)

3. To what extent do you think this course will assist you in applying acquired skills in real work environments?

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 3 (60%) 2 (40%)

4. To what extent do you think this course will assist you in completing the PPA culminating project course?

Very Helpful Helpful Somewhat Helpful Almost No Help No Help 4 (80%) (+ 1 no response)

5. How many information technology training sessions did you attend (including class orientations, workshops, special sessions with one of the consultants, or by individual appointment)?

One Two Three Four Five or more 1 (20%) 1 (20%) 2 (40%) 1 (20%)

6. Would you recommend this course to others?

yes no 5 (100%) 0

7. Would you be interested in taking another course with this same course format?

yes no 5 (100%) 0

8. To what extent is there evidence of collaboration by teaching and library faculty in planning this course?

Very much Much Some Little Almost None Don't Know 4 (80%) 1 (20%)

9. To what extent have faculty been successful in integrating the subject content of this course (health planning and policy) with information technologies?

Very much Much Some Little Almost None Don't Know 3 (60%) 2 (40%)

10. Compared to other courses you have taken that were taught by one faculty member and were based in a single discipline (subject area), how did you like this course for:

a. capturing your interest?

Much More More Same Less Much Less No Opinion 2 (40%) 3 (60%)

b. challenging you to think?

Much More More Same Less Much Less No Opinion 3 (60%) 2 (40%)

BIOGRAFICAL NOTES
Copyright Statement

Interpersonal Computing and Technology: An Electronic Journal for the 21st Century

© 1999 The Association for Educational Communications and Technology. Copyright of individual articles in this publication is retained by the individual authors. Copyright of the compilation as a whole is held by AECT. It is asked that any republication of this article state that the article was first published in IPCT-J.

Contributions to IPCT-J can be submitted by electronic mail in APA style to:

Susan Barnes, Editor

SBBARNES@PIPELINE.COM or BARNES@MURRAY.FORDHAM.EDU