

Using the Internet for Instruction: Experiences, Possibilities, and Considerations¹

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Abstract

The founding of the Internet largely bypassed the Land Grant Universities, as initial development was focused at Defense Department laboratories and a small number of related institutes at elite research universities. Colleges of Agriculture (CoA) embraced the technologies and, perhaps due to more adequate funding, were often among the leading units to adopt computer technology in their respective universities. This paper considers some of the possibilities of Internet technologies for teaching. The primary objective is to illustrate how Internet usage has evolved to become an essential tool for facilitating teaching efforts. Internet technology positively impacts instruction in the CoA by being fashionable and attractive to students; helping to increase collaborative work and cross institution communication; it is ideally suited for remote learning; and it is suitable for accessing resources and various media. The benefits center on the sharing of instructional materials and the ready availability of source material photographs, diagrams, data to augment lecture materials. Instructors have an expanded ability to interact with their students, to receive feedback, to supplement lecture material, and coordinate course activities through e-mail. Important cautions about the Internet relate to instructor control of course materials, plagiarism, proper attribution of source material, and the time demands associated with student chat sessions, e-mail, and Website maintenance. Expectations for use of Internet resources must be balanced by realistic appraisal of the benefits to be derived given the time investment required, the supporting resources available, and the opportunity costs to instructors relative to other responsibilities.

The Internet has become a daily tool for communication and information retrieval among College of Agriculture (CoA) faculty (Dahlgran, 2003). Many new Internet possibilities for information sharing, networking, and problem solving have significant implications for teaching, research, and extension. We first trace some of the development and spread of the Internet in the CoA context. The paper then considers some of the consequences and cautions of these technologies for the conduct of teaching activities.

What is the Internet?

A number of books and sources have helped provide an understanding of the Internet, but Krol's *The Whole Internet* -- and its subsequent revisions -- is identified by many as seminal works on the topic (Krol, 1994; Conner-Sax and Krol, 1999). Today, the Internet is not owned or funded by any one institution, organization, or government; it is a self-sustaining global information infrastructure accessible to hundreds of millions of people around the world (Garston, 2000). The Internet's primary mechanisms for communication and information sharing are e-mail messages, instant messaging, Weblogs, and Webpages.

E-mail

The Defense Advanced Research Projects Agency (DARPA) program, unheard of by most university faculty in 1975, initiated a project at the RAND Corporation to develop an electronic mail capability for the Unix operating system (*Living Internet*, 2002a). Today, e-mail is an integral part of most faculty members' daily work routines. The majority of information sharing, queries over matters large and small, sharing of documents, and other daily communication transactions that integrate faculty members with their peers, students, and administrators are now conducted by e-mail. Electronic mail, discussion groups, and electronic mailing lists (Listserve) facilitate mass sharing of information, a process that has become particularly important for CoA faculty working with their students, each other, and clientele groups in the agricultural industries and businesses.

Instant Messaging

Instant messaging (IM) enables people all over the world to talk together in online, real-time sessions in virtual rooms. A generational phenomenon, more young people seem to subscribe and maintain IM networks and relationships. One survey commissioned by the Pew Foundation's *Internet and American Life* project reports that on a typical day, 26% of college students use IM; students are twice as likely to use IM on any given day compared to the average Internet user (Pew Foundation, 2002). Most web-based teaching programs such as WebCT and

¹Revised version of a paper presented to the biennial meeting of NACTA, San Luis Obispo, CA that was originally prepared for Phase III of Class 12 of the ESCOP/ACOP Leadership Development Program. Participation supported by the Auburn University College of Agriculture and the Alabama Agricultural Experiment Station. We thank the anonymous reviewers and J. Sibley, P. Duffy, R. Nelson, and E. Simpson for helpful comments on previous drafts of this manuscript. Email: jmolnar@acesag.auburn.edu

Blackboard support chat sessions that instructors can use to augment class lectures, resolve homework problems, or otherwise extend the boundaries of the course experience.

Web Pages

Web pages are a repository for information spanning the spectrum of the CoA mission. The World Wide Web (or the Web) is one of the most accessible tools available for faculty to use to provide information to their students. Web pages facilitate access to curriculums, departmental policies, degree requirements, course schedules, as well as information about faculty and their programs. Course Web sites are often designed as portals or major starting points for students connecting to the Web on the instructional subject. Yet search engines such as Google and Yahoo have emerged as primary means whereby users connect to the information they seek (Schraefel et al., 2002). These online tools seem to provide more immediate gratification to the searcher in terms of productive links to the content that was needed.

A major concern for CoA faculty is the reliability of online information and the need to instill students with the ability to make careful judgments about the quality of the information found. The Agriculture Network Information Center (AgNIC) Alliance began in 1995 with land-grant institutions and the National Agricultural Library committed to a partnership to provide access to quality information and resources over the Internet (AgNIC, 2004). Each of the many collaborating institutions and organizations provides a gateway to the world's electronic resources on a given agricultural topic.

Weblogs

Although there is some controversy about what constitutes a Weblog or blog, at the heart of the blog is a Website with dated entries of commentary, personal thoughts, and essays. The first weblog was <http://info.cern.ch/>, which was built by Tim Berners-Lee at CERN (Blood, 2000). Any individual willing to spend several hours every day surfing the Web and posting to the weblog site can become a blogger, which is an important democratizing force on the web. Weblogs can provide a valuable filtering function for their readers. Weblog editors participate in the dissemination and interpretation of the news by searching out articles from lesser-known sources, and by providing additional facts, alternative views, and thoughtful commentary. Editors highlight articles that may easily be passed over by the typical Web user who is too busy to do more than scan corporate news sites (Blood, 2002). Some faculty maintain weblogs in their subject matter areas to foster dialogue or simply occupy a place of centrality in cyberspace. Most agricultural weblogs focus on very specific commodities or issues, such as sunflowers or agricultural subsidies. The weblog is emerging

as an important new tool in the exchange of information and development of ideas.

Internet and Instruction

Students

The Internet may be fashionable and attractive to students because it has become such a part of the fabric of their connection to their peers and the larger culture. Use of the Internet is a part of college students' daily routine, in part because they have grown up with computers. As a truly wired generation, today's college students are early adopters and heavy users of the Internet compared to the general population (Pew Foundation, 2002). Integrated into their daily communication habits, the Internet has become a technology as ordinary as the telephone or television. Nearly all U.S. college students have gone online for one purpose or another, compared with 59% of the general population. College students frequently look for e-mail, with 72% checking e-mail at least once a day. About half (49%) first began using the Internet in college; half (47%) first began using it at home before they arrived at college (Pew Foundation, 2002).

The great majority (85%) of U.S. college students own their own computer, and two-thirds (66%) use at least two e-mail addresses. Seventy-eight percent of college Internet users say that at one time or another they have gone online just to browse for fun, compared to 64% of all Internet users (Pew Foundation, 2002). Although data comparing CoA student Internet usage to the general university population are not available, computer courses and computer facilities were often made available to agricultural students earlier than to the general university population outside of engineering.

College students use the Internet to communicate with professors and classmates, to do research, and to access library materials. The students say the Internet has enhanced their education (Pew Foundation, 2002). Internet use is a staple of college students' educational experience. For most college students the Internet is a functional tool, one that has greatly changed the way they interact with others and with information as they go about their studies. Nearly four-fifths of college students (79%) agree that Internet use has had a positive impact on their college academic experience (Pew Foundation, 2002).

Almost half (46%) of college students agree that e-mail enables them to express ideas to a professor that they would not have expressed in class, but some interactions are still primarily face-to-face. Only 19% of students said they communicate more with their professors via e-mail than they do face-to-face (Pew Foundation, 2002).

Nearly three-quarters (73%) of college students say they use the Internet more than the library, while only 9% said they use the library more than the Internet for information searching. About half of all college students (48%) are required to use the

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Internet to contact other students in at least some of their classes. Two-thirds (68%) of college students reported subscribing to one or more academic-oriented mailing list that relate to their studies (Pew Foundation, 2002).

More than half (58%) of college students have used e-mail to discuss or find out a grade from an instructor. Nearly two-thirds (65%) of college students who e-mail professors say they report absences via e-mail (Pew Foundation, 2002). Although the study did not focus on wireless technology, the authors did delicately predict that issues readily apparent with the spread of cell phones, such as etiquette and distraction, are likely to emerge as students are able to access the Internet anywhere, including in classrooms.

Wireless Networks

Local area networks Wi-Fi (wireless fidelity 802.11) that allow students to surf the net while in class have proven problematic for instructors. Most professors view computer use during lectures as rude and feel that other students are "demoralized" by seeing their peers' attention wander. One professor at a law school in Texas became so upset by the level of student distraction in 2001 that he took a ladder to school, climbed up to reach the wireless transmitter in his classroom and disconnected it. The students protested. The administration told him to plug it back in. But the point was made, he said, and he regained the attention of the class (Schwartz, 2003).

Some faculty suggest that the increased potential for distraction posed by laptop Internet surfing and now cell phone, image exchange, e-mail checking, and Internet surfing makes them better teachers. The threat of losing students to e-mail, text messaging, and online newspapers is a challenge to keep lectures interesting and lively. Students report using the Internet in class to look up an article or quote during discussion, but also feeling the temptation to surf the Internet during lectures (Schwartz, 2003). If a professor is not productively connecting to the students, they have other electronic avenues of engagement.

Course Notes

Students have always missed classes, but the Internet provides new methods of compensating for missed lectures. Sharing class notes has always been common. Many instructors put their PowerPoint slides on the Web to allow students to clarify their personal notes, see what was covered when they were absent, or review for examinations. At some universities, students also have had the option of purchasing lecture summaries from a local note taking business. Recently, the Internet has entered this equation, and with it has come a significant amount of controversy (Hoeper, 2000).

More than 10 Internet companies have emerged to offer free notes for thousands of lectures nation-

wide. These companies recruit students from over 100 universities and colleges to post their lecture notes online. Currently, the two largest companies pay student note takers roughly \$400 per semester for their participation. Once online, the notes can be viewed by anyone (Hoeper, 2000).

In general, university faculties encourage students to take notes in their classes, laboratories, and congregate lectures. Taking notes is a means of recording information, but more importantly, of personally absorbing and integrating the educational experience (University of Minnesota, 2003). On the face of it, taking notes with pen and paper would seem to offer some basic human learning advantages over the distractions of laptop note taking, not to mention the cumulative impact of keyboard noise. Taking notes by hand allows many students to be in touch with what the teacher is saying. Reliance on purchased notes bypasses this experience.

Some maintain that availability of online notes could mean that students will start to develop a very short-sighted and narrow perspective of education that views teaching as merely getting the notes to pass the exam (Hoeper, 2000). Another concern is that students who rely solely on re-printed lecture notes may get inaccurate information. Most of the online distributors of lecture notes have no way to edit for content or accuracy. Obviously, something could have been written down wrong and errors in the commercial notes off the Internet may cause problems in exams, although instructor-supplied notes may enable listening in class and facilitate study at home.

Tufte (2003) maintains that PowerPoint and other presentation software undermine the quality of intellectual exchange. He argues that bullet point summaries dilute thought, are too generic, omit relationships, and omit assumptions. Yet such software remains a popular and useful tool for organizing lecture notes.

While collaborative note sharing and discussion helps students learn, the organization, preparation, and presentation of materials in a class or other instructional setting represents the intellectual effort of the faculty or instructor (Kelley, 1998). Many universities have adopted policies prohibiting students from selling their notes to online companies (Hoeper, 2000). Instructors have an interest in protecting their intellectual property and in assuring the accuracy of any public representations of their course lectures. One university's policy asserts that the sale or broad dissemination for commercial purposes of class notes by students without faculty permission violates these interests and is considered an offense against the academic community (University of Minnesota, 2003).

Instructors

The Internet provides academics with an opportunity to make their teaching better, to allow them to

teach in different ways than the standard one-to-many lecture, and to reach more students. Simply put, the Internet allows for the maximization of learning which, Somekh (1996) asserts, can be measured either in terms of the increase in the amount of learning, or in terms of the increase in the quality of learning.

Internet instruction can provide more efficient and interesting way of imparting knowledge one basic definition of teaching. In many cases, Internet courses can be less expensive to offer than some forms of live instruction, as well as relatively easy to use (as both an author and a learner). Internet-based instruction allows access to resources from various mediatext, graphic, audio, and video. Internet instructional materials also are appropriate for remote learning, i.e., they confer independence from the classroom either by location, time, or both. The Web can interlink resources held in other subject areas and institutions.

A successful teaching model using the Internet can involve seven processes of student learning: orientating, motivating, presenting, clarifying, elaborating, consolidating, and confirming. Each student learning process can be augmented, supplemented, or extended through the Internet.

Instructor Email and messaging can keep students oriented to course objectives and direction. The Internet has increased instructor access to students beyond the normal hours of lecture or laboratory. Course management is facilitated by e-mail messages that clarify assignments, reiterate verbal instructions about testing procedures, or provide additional course content. Lagging students can be served notice of their attendance or performance problems and given guidance for improvement. Judicious use of instructor e-mails to classes keeps students focused on the course, its objectives, and its requirements.

Motivation can be stimulated by through images and multimedia presented through the Internet. In highly technical courses, cell structures, molecular arrangements, or other complex matters can be clarified when students independently review the lecture presentation on the Web. Such topics can also be presented from other points of view or with additional Web-based images or diagrams to elaborate understanding, particularly on agricultural topics where urban and suburban students may have little direct experience.

Exercises and online participatory experiments or games can consolidate learning by making students in CoA courses grapple with real-world ethical dilemmas or tradeoffs associated with, e.g., resource management, animal welfare, or biotechnology. Web-based simulations can precipitate insights and perspectives otherwise not readily achievable by other means.

Web-based testing can confirm knowledge and provide immediate feedback. On-line examinations

can conserve lecture time and otherwise focus instructor efforts on instruction.

In an early and comprehensive treatment of the issue, Laurillard (1994) asserts that the Internet does work as an effective teaching tool, particularly when it furthers learning through guided discovery. Learning is then seen as an active, self-constructed process in which learners acquire new ideas or concepts based on their existing knowledge and skills. The flexibility of Internet resources may then be seen as empowering self-constructed learning. The challenge to CoA instructors is to exploit the new technology possibilities in ways that truly advance the rate and durability of learning that takes place in their courses.

Distance Learning

As a result of technology development, distance learning has become a popular topic in many universities. The distance learning format provides a method for expanding educational efforts beyond the traditional classroom. Educators often pursue distance learning endeavors without consideration of the cost associated. This section presents alternative forms of distance learning, associated costs, and program evaluations.

Distance learning programs provide an education and training alternative in lieu of the traditional physical classroom (Monolescu et al., 2004). One form of distance learning occurs when an instructor places courseware on a Web server where it can be accessed from afar. Such systems can be expensive if one is to ensure enough material is made available readings, exercises, and software--to meet the demands of a complete syllabus.

Alternatively, there is the independent study in which learners search the Internet for materials that are relevant to their interests (Simonson et al., 2002). Lee et al. (1999) note that technology should not be used to replace teachers or teaching. Technology should be used as a supplement to teaching, or as a replacement for the absence of teaching, e.g., by making material available if a course is not currently available, or to remote/life-long learners who are not linked to an institution of higher learning. One effort to estimate the cost of delivering an online course in educational technology found that online delivery cost is just over twice the cost to deliver by traditional distance education using print-based resources (Webb and Cilesio, 1999).

Gibson (1997) describes the evaluation of a web-based teaching module for students enrolled in an Australian distance education course. Overall, student acceptance of the web-based method was very high and results were better than usual in distance education, judged by rate of course completions. However, problems were encountered in terms of the amount of administrative work required. In addition, the testing procedures duplicated existing mail based methods, and better approaches are needed for Web-based delivery.

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Maki and Maki (2002, 2003) found that undergraduates enrolled in introductory psychology performed better in distance-education courses, but were generally less happy with them. The authors report that the Web made it easier to structure the course so students were able to get immediate and individualized feedback. Instead of spending time preparing and delivering lectures, more attention could be devoted to interaction on a more personal level. Most students preferred the lecture format; they felt that the Web-based course was more work because of the more frequent deadlines associated with online assignments. The average student seemed to respond slightly better to an online course format; although course performance was mediated by a dimension they termed media comprehension skills. Similarly, Duvall and Schwartz (2000) found that the course performance of adult distance learners and their on-campus counterparts was mediated by a dimension they called technological adaptability, the lack of which inhibited online learning.

Among the many advantages inherent in teaching on-line, one of the most important benefits is the ability to share courseware and resources across institutions. Distance learning often depends on ready access to materials prepared by others and made openly available on the web. Some universities (and faculty) have moved to protect their intellectual property by limiting access to course websites through secure Intranets and other means. Others take a community-of-scholars point of view and make their work freely available on the Internet. In theory, such measures could serve to reduce the workload on academics. Although many scholars express problems with using off-the-shelf material in their teaching (i.e., the 'not invented here' syndrome), one could simply look on this as one would a textbook or edition, which has been produced by a single author but used by many institutions. Some Web-based efforts have been intentionally designed to exploit these possibilities.

Agripedia (<http://www.ca.uky.edu/agripedia/>) is an interactive multimedia instructional resource developed by the University of Kentucky's College of Agriculture to allow students to use resources across the country in an integrated, interactive learning resource on the Internet. As an "encyclopedia of agriculture", Agripedia presents facts, figures, demonstrations, examples, graphics, and more regarding the concepts, practices, and vocabulary of agriculture in a multimedia format using audio clips, graphics, text, and animation. Agripedia is intended to not only provide ready access to instructional sites on the web, but also to help students navigate the Internet (Agripedia, 2003). Although a grant supported the development of Agripedia, the cost-recovery models for maintaining and advancing its capabilities are not clear.

Many of the advantages of online delivery of

instruction lie in comparisons to traditional print-based distance education. The advantages lie in increasing their ability to manage what is taught. The online environment has empowered participating instructors to add their own interpretation on top of the standard learning materials.

Blackboard and WebCT are examples of interface software designed for use in traditional course management as well as distance learning (for a comparison, see Siekmann, 2001) that enable instructors to add an online component to traditional classes or teach in a fully online course environment. WebCT (2003) notes that online courses facilitate access to scholarly resources and may better prepare students for the lecture and lab experience. Online courses provide access when the student is ready to learn. As such it may promote self-directed learning, facilitate communication with students, enable active engagement with the course content, and create opportunities for students to be knowledge builders. The advantage that web-based learning has over computer-based learning is the sense of community and interactivity that the Web can provide (WebCT, 2003).

Concerns

The American Association of University Professors (AAUP) circulated a letter in response to a U.S. Government white paper asserting that instructional software could easily substitute for campus-based instruction. The document calculated that only 25 on-line courses were needed to serve about 80% of undergraduate courses. The AAUP, happy to embrace the Internet and on-line teaching, and recognizing that technology has helped 'streamline academic life', was still concerned enough to state 'high quality teaching, whether done on a distance-learning basis or on a campus basis, requires contact'. Further, that "...when they basically want to replace people with computers, that's where we draw the line...we objected to the extreme views, like beaming an image of professors to students and thinking that would be a satisfactory way of replacing a face-to-face education" (Lee et al., 1999, p. 8).

Ironically many universities offer electronic instructional methods as a premium product for students seeking the MBA, other graduate degrees, or advanced technical certification. Students, or more often their corporate sponsors, typically pay a surcharge for such courses of study. In so-called satellite courses, dispersed sets of motivated learners often with employer sponsorship interact with professors in highly organized course experiences. Note, however, that these advanced learners already have had the face-to-face educational experience that built a foundation for constructive participation in Internet instruction.

The main concern about web-based instruction is not so much the specific system used, but rather, given the potentials and limitations of this type of

Internet application, how do instructors ensure that they use it in a pedagogically effective way. Web-based instruction may encourage learners to interact with one another over time. This time independence allows students to fit their on-line discussions around their other commitments and responsibilities. Different work patterns can be supported while maintaining a feeling of community among the students and staff participating in the course. This is particularly pertinent where students are distributed around the world and potentially in different time zones (Lee et al., 1999).

The anytime, any place advantage for learners can be a disadvantage for teachers. Brabazon (2001) notes that the Internet has increased student access to the instructor. While such access can be framed as beneficial to students and education broadly defined, it has emerged during the very period when faculty research and administrative responsibilities also have increased. Despite these pressures, she notes that some writers question why instructors seemingly resist Internet-based teaching.

Expectations for instructors to use the Internet come from students, peers, and administrators, though is not always clear that the appropriate resources or motives accompany the expectations. Building instructional materials for the Internet requires significant time and effort; yet financial and professional rewards are typically attributed to extramural research funding, scientific publications, and patents. To use the Internet intensively, faculty must attend to delivery management systems. In the past, instructors wrote study guides, but did not have to think about how the publication was photocopied and distributed. Now, faculty must not only write teaching materials, but structure it within templates, keep hypertext links current, and address student queries when they cannot access the site. Vachris (1999) maintains that online technology promotes a more cooperative learning environment, but this interaction is more costly in terms of instructor time than is the case of a traditional classroom. Despite the contradictions in many institutional incentive systems, there remains a strong professorial commitment to instruction, to innovation, and to exploring the intrinsically interesting possibility of new ways of presenting information and fostering student learning. These forces seem to keep alive faculty interest in Internet experimentation and course implementation (Gibbs et al., 1996; Kennedy, 1997).

Webb and Cilesio (1999) report that one of the major disadvantages identified by online teachers is the difficulty in estimating the length of time needed to complete any one of the defined online teaching tasks. While online teachers derived much satisfaction from teaching in the online program they examined, they found it was difficult to determine realistic time frames to establish the extent of teacher participation for both the teachers themselves, as well as those managing the program. Webb and

Cilesio speculate that educational managers may find the costs unacceptable except for selected experimental courses such as the one in question. Therefore, it is essential that the online delivery be recognized as a viable and distinct delivery methodology and funded accordingly.

Many instructors find the Internet to be a daunting and burdensome set of tasks. When student and administrative expectations ratchet forward to encourage faculty to exploit new possibilities, instructors often find the many new and fast-changing features of the Internet stretch their personal capabilities. Instructors face dilemmas about how to maintain currency in their disciplinary subject matter, while also developing and maintaining a competence in Internet information formats and tools. Clearly, the availability of competent and responsive trainers and technical assistants is necessary for individual and institutional excellence.

Brabazon (2001) finds that while the conditions of academic work are changing and becoming saturated with economic imperatives, university structures are still reliant on the vocationalism and good will of scholars. There is an assumption that teachers will complete work and training for which they are not paid. Internet activities take time away from research, grading, and lecture preparation. Many university scholars have freely given time for a pedagogy that has increased their own workload. In some situations, the Internet may have transformed teachers into content providers--managers of information and designers of Web sites (Kelley, 1998).

Technology should only be used where a noticeable gain to teaching quality is evident. Bearing in mind the considerable costs (both in terms of finances and time), it is not enough to simply employ web-based instruction on the basis that it will not do any harm. Also using every bit of new technology that is available is not essential. Sometimes the most noticeable effects can be derived from very easy-to-use methods, most immediately in terms of facilitated communication with students.

Conclusion

The founding of the Internet largely bypassed the Land Grant Universities, as initial development was focused at Department of Defense laboratories and a small number of related institutes at elite research universities. Colleges of Agriculture later embraced Internet technologies and perhaps due to more adequate funding were often among the leading academic units to introduce computer instruction in their respective universities. Nonetheless, the U.S. Land Grant research and extension system is a small stream in the ocean of the Internet.

The emerging possibilities for instruction in the CoA are many, but they center on the sharing of instructional materials and the ready availability of online source material (e.g., images, presentations, diagrams, and data) to augment lecture materials.

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Instructors have expanded ability to interact with their students, to receive feedback, to supplement lecture material, and coordinate course activities through e-mail.

Important cautions about the Internet emerge from student access that circumvents instructor control to course notes, term papers, and even previous examinations. Plagiarism and proper attribution of source material is a challenge to students and instructors who must evaluate the material. Computer use in classrooms during lectures, particularly accompanied by access to wireless networks, can be disruptive and distracting to students and instructors alike. Expectations for use of Internet resources must be justified by added marginal value to the instructional activity. Internet use must be balanced by realistic appraisal of the benefits to be derived given the time investment required, the supporting resources available, and the opportunity costs to instructors relative to other responsibilities.

The possibilities for researchers are numerous and varied, but center on increasingly efficient and rapid access to software, data, and published materials. Internet-based data collections systems facilitate the acquisition of data from remote locations in real-time for natural and social scientists alike. Communication with colleagues and collaborators near and far can be rapid, responsive, and comprehensive. Weblogs are emerging as significant aggregation points for new ideas and opinion. Electronic journals may foster widespread dissemination of research findings.

Cautions for researchers bear on the increasingly real risks of information overload and the need for selectivity in accessing and referencing sources. The quality of web-based information is increasingly called into question. Web-based publishing may increase the rapidity of scientific communication, but it may undermine the rigor of findings that are prematurely distributed to a wide audience. Web pages also may be one important means for reaching an increasingly Internet-capable farm and land-owner community with applied research results (NCSU, 2003).

The Internet has become an established venue for the CoA faculty effort, one with great promise as well as great risks. Steady advances in computer capability and software sophistication offer many new possibilities for instructional innovation. Finding the proper balance among human contact in the classroom, electronic communication, and web-based instructional resources is a continuing challenge. Harmonizing teaching and technology will be an ongoing theme in CoA faculty time management and professional development. Expectations for use of Internet resources must be balanced by realistic appraisal of the benefits to be derived given the time investment required, the supporting resources available, and the opportunity costs to instructors relative to other responsibilities.

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