Twenty-first century college syllabi
Options for online communication and interactivity

Jack A. Cummings[a,*], Curtis J. Bonk[b,1], F. Robert Jacobs[c,2]

[a]*Room 4140, School of Education, Indiana University, 201 N. Rose Avenue, Bloomington, IN 47405-1006, USA*
[b]*Room 4022, Department of Counseling and Educational Psychology, School of Education, Indiana University,*
201 N. Rose Avenue, Bloomington, IN 47405-1006, USA
[c]*Room 670, Business School, Indiana University, Bloomington, IN 47405, USA*

Abstract

In this study, the World Lecture Hall provided an entry point to examine Web-based syllabi of current college courses offered in schools of education. An initial overview of the course syllabi in the World Lecture Hall, in conjunction with a review of professional literature on the instructional uses of the Internet, led to the creation of a 3×3 matrix for categorizing the forms of communication and interactivity facilitated by Web-based syllabi. Three participant levels—instructor, students, and practitioners/experts—were crossed with each other to form the matrix. In general, the analysis of the current Web-based syllabi could be characterized by the unidirectional flow of information from instructors to students. A minority of instructors incorporated innovative components that facilitated Web-based learning and interaction outside the conventional classroom. The discussion addresses ways instructors can post more interactive Web syllabi, share course resources, and infuse additional resources into their courses. © 2002 Elsevier Science Inc. All rights reserved.

Keywords: Web-based syllabi; Future; Interactivity; Collaboration; Frameworks; Web-based instruction; Changing instructional models

* Corresponding author. Tel.: +1-812-856-8327; fax: +1-812-856-8333.
  E-mail addresses: cummings@indiana.edu (J.A. Cummings), cjbonk@indiana.edu (C.J. Bonk), jacobs@indiana.edu (F.R. Jacobs).
  [1] Also corresponding author. Tel.: +1-812-856-8353; fax: +1-812-856-8333. http://php.indiana.edu/~cjbonk.
  [2] Tel.: +1-812-855-2676.

1. Introduction

The lure of technologies for promoting student learning has captured the attention of the educational community. This is witnessed by the phenomenal growth of activity on the Internet and the allocation of pages in education journals during the last 3 years. Whereas Rud (1997) implicated the increased use of computers as a culprit in reducing time for reflective activities, such as reading print books and writing essays, others have marveled at the advantages of access to the world's largest library of text, audio, and video materials (Malikowski, 1997). The recent emergence and constantly changing nature of the World Wide Web, combined with lofty instructional forecasts, create prime conditions for confusion, criticism, optimism, and debate.

Interesting ideas and provocative debates about the educational potential of the Web have been particularly salient in the *Educational Researcher*. Mergendoller (1996) was among the first to point to the need to link pedagogy to prevailing technological infrastructure. At about the same time, Fetterman (1996) argued that the emergence of online learning tools—including inexpensive Internet videoconferencing tools—dramatically changes the nature of teaching and learning. Electronic office hours, file sharing, and assignment completion are just the start. Two years later, Fetterman (1998) described a number of Internet resources and ideas that had the potential to positively impact educational research. At about the same time, Windschitl (1998) detailed a series of thought-provoking research questions that needed to be addressed before declaring the Web to be a useful environment for teaching and learning. Similarly, Owston (1997) raised pivotal questions about whether emerging Web-based learning technologies can increase access to education, promote better student learning, or control educational costs.

Shortly after, Roschelle and Pea (1999) added to Owston's dialogue related to access, learning, and cost of Web-based instruction while extending it to questions about whether the Web can improve educational research. While more pessimistic than others like Owston and Fetterman, Roschelle and Pea pointed to next steps toward the development of online learning tools. They also offered ideas related to accumulating and disseminating research findings, building distributed learning communities, creating partnerships between researchers and corporations, and helping the classroom teacher. To them, cross-institutional and interdisciplinary groups are necessary conditions for the creation and promotion of the useful educational visions related to the Web. By finding some consensus on issues while creating unique partnerships and coalitions, they hope to overcome the weaknesses of Web-based learning in place today.

While Roschelle and Pea correctly identified a need to marry emerging educational technologies with pedagogical and curricular innovation, there is a parallel need for additional frameworks for thinking about Web-based instruction. In response, we have offered frameworks for thinking about learner-centered Web instruction (Bonk & Cummings, 1998), the integration of the Web in one's instruction (Bonk, Cummings, Hara, Fischler, & Lee, 2000), the role of the online instructor (Bonk, Kirkley, Hara, & Dennen, 2001), and instructional strategies to foster teamwork and higher-order thinking on the Web (Bonk & Reynolds, 1997), as well as a framework to link all the previous frameworks (Bonk & Dennen, in press).

Along these same lines, this article provides a framework for reflecting on the types and forms of interaction made possible by the emergence of the Web.

Despite all the recent press, some scholars may wonder what tools are available for Web-based instruction. In brief, tools exist to market one's class, post student work, discuss course material, collaborate with other classes, take examinations, and offer entirely new educational programs. Combine these new teaching options with multiple levels of Web integration and naturally most instructors and universities find themselves in a precarious situation (Bonk et al., 2000). Just what does it mean to teach on the Web? And how should one take advantage of what the Web has to offer? For instance, is it best to teach a course fully online or mix face-to-face instruction with supplemental Web resources? In addition, will the new connectivity increase student social interaction and collaboration or will the Web be a tool to conduct business as usual?

To begin answering some of these questions, we explored the electronic syllabi of education professors in various college and university settings. By exploring these syllabi, we hoped to discover how the Web might already be altering conventional instructional practices. In effect, these early Web-based syllabi offered a glimpse into the instructional possibilities of the new millennium.

2. Syllabus traditions

For the majority of the 20th century, university instructors have started the first day of class by distributing their syllabi and explaining their overall course plan. Most syllabi have had information about the objectives and expectations of the course, meeting times, required books, office hours, information about readings on reserve at the library, and how to contact the instructor. Occasionally, addenda were provided during the semester when there were changes to the schedule or clarifications of assignments. Times have certainly changed, however. While e-mail is often used for minor course changes and task structuring, the Web now offers a vehicle for more extensive electronic dissemination of course materials and task changes together with the means for promoting student interaction and dialogue.

In a recent study by Bonk (2001), college instructors ranked tools to post their course syllabi online as more important than any other Web-based instruction tool listed. Not only did 72% of the faculty respondents report this feature as highly useful but also over 85% actually used such a tool in their courses. These findings also match the Web-based Education Commission (2000) report, which documented the increased posting of course syllabi to the Web and incorporation of Web resources within college instructor syllabi. The fact that more use this type of tool than rate it as highly useful indicates it is relatively easy to do.

The large number of respondents using tools to post their syllabi online reveals an initial area of penetration for the Web in college teaching and learning. For example, the University of Michigan School of Information has compiled a list of faculty course syllabi and placed it online (http://intel.si.umich.edu/cfdocs/si/courses/home/splash.cfm). Similarly, the UCLA Humanities Department created the E-Campus (http://ecampus.humnet.ucla.edu/) for syllabi, assignment announcements, and other course-related links. Many college campuses and

departments presently offer such online syllabi listings or portals as a way to market and share course and degree information.

The "World Lecture Hall" (see http://www.utexas.edu/world/lecture/) is another place that encourages college instructors to post their syllabi online. A review of Web-based syllabi posted to the World Lecture Hall from various educational disciplines or departments lends insight into the potential directions of online learning during the next century. According to the 1999 statistics of the World Lecture Hall, there were 5000 daily visitors and 200 syllabi submitted per month of which half were typically accepted.

Why is the analysis of online syllabi important? In an age of constructionism and learner-centered practices, instructor lecturing to students is no longer the only standard by which a learning environment is judged (Bonk & Cunningham, 1998). Peers, experts, practitioners, and the surrounding community can all influence student activities and engagement in effective learning environments (Rogoff, 1995; Tharp & Gallimore, 1988). Consequently, in evaluating online learning or any type of learning for that matter, we need to understand the role of each participant and resource in enhancing and assisting in the learning environment.

The purpose of this paper is to explore the potential of electronic syllabi to make university-level courses more interactive. What follows is a compilation of ideas extracted from syllabi found in the World Lecture Hall, as well as a framework for thinking about the forms and range of interaction within Web courses. Our experiences in teaching on the Web at Indiana University during the past few years have helped shape this particular framework. Stated another way, our review of syllabi accessed via the World Lecture Hall combined with personal reflections on our own Web-based instructional practices led us to consider the numerous ways communication takes place within the digital domain.

The electronic environment of the Web fosters rapid information flow from the instructor to students, students to the instructor, and students to other students. Perhaps more importantly, such electronic information flow is now possible to and from practitioners. This article, therefore, is an attempt to illustrate the dynamic nature of electronic learning and interaction. As will become clear from our analyses of education-related syllabi submitted to the World Lecture Hall during the past few years, interactions on the Web can extend far beyond simply uploading a syllabus for convenient distribution.

3. Methodology for review of syllabi in the World Lecture Hall

An initial overview of course syllabi in the World Lecture Hall, in conjunction with a review of professional literature on the instructional uses of the Internet, led to the creation of a 3×3 matrix for categorizing components of Web-based syllabi (see Table 1). Three participant levels—instructor, students, and practitioners/experts—were crossed with each other to form the matrix. The matrix was used to systematically categorize the various forms of communication facilitated by Web-based syllabi. As shown in Table 1, information can be transferred from an instructor to students (instructor–student), from an instructor to other instructors (instructor–instructor), from an instructor to practitioners/experts (instructor–practitioner/expert), from students to the instructor (student–instructor), and so forth.

Table 1
Web-based communication flow among instructors, students, and practitioners/experts

	To students	To instructors	To practitioners/experts
From instructor	Assignment schedule	Online syllabi (e.g., the World Wide Lecture Hall, MERLOT.org, CourseShare.com)	Learning communities
	Class roster (perhaps with student email addresses)	Web forums or discussions on course material (perhaps coordinated by textbook companies)	Online tutorials
	Lecture notes/PowerPoint slides	Lecture notes/activities	Products for field applications
	Public/private feedback	Teaching stories, ideas, and associated commentary	Listservs
	Web links to local and worldwide resources	Listservs	Electronic conferences
	Instructor profiles		Research articles
	Assignment clarifications		General information
	E-mail to clarify assignments		
	Web site changes to notify students of course changes		
From students	Exemplary models of past students' work	Journal reflections	Web page links
	Post or publish current student work	Online quizzes/tests	Resumes on the Web
	Within-course discussions in listservs or electronic conferences	Preclass session balloting	Field reflections and commentary
	Outside of course discussions	Reflective electronic minute papers	
	Virtual debates	Session evaluations	
	Sharing links	Anonymous feedback	
	Coffee houses, introductions, and personal profiles	Instructor email feedback	
	Personal portfolios of work		
From practitioners/ experts	Teleapprenticeships and online mentoring	Course feedback	Virtual professional development communities
	Announcements of jobs and internships	Usable real-world scenarios and cases	Listservs
	Virtual field trips	Listservs	
	Conference posting feedback (e.g., case solutions, test answers, and field reflections) as well as counterexamples and alternative solutions		

Syllabi eligible for inclusion in the study were scrutinized with a template of the individual items listed in each cell of the matrix. For instance, as noted in Table 1, a student might

provide another student with Web links, task examples or models, and alternative perspectives within debates and discussions. Practitioners might provide students with information about jobs and internships, as well as virtual fieldtrips and teleapprenticeship opportunities. Instructors might provide other instructors with sample syllabi, pedagogical ideas, Web links, lecture notes and activities, and electronic discussion forums. Clearly, there is a range of communication opportunities when incorporating the Web in one's instruction.

As of May 5, 1999, 79 of 130 syllabi posted in the "Education" section of the World Lecture Hall met the criteria of having a functional address, being current (i.e., offered from 1998–1999), and representing a university-level education class. These 79 syllabi were analyzed for the degree to which different interactions were present. The reliability of categorizations was obtained by having a second reviewer reanalyze 15 randomly selected syllabi from the pool of 79 syllabi. Interrater reliability between the two raters was 98.2%.

Table 1 illustrates the great variety of interactive activities reported in the professional literature and found in this pool of college syllabi. As indicated, a dynamic syllabus facilitates multidirectional information flow between students and instructors (e.g., from the instructor to students, from students to the instructor, from students to other students, etc.), while perhaps also incorporating dialogue with practitioners or experts in the field. Due to the asynchronous nature of much of the interaction, the Web provides new and exciting ways to facilitate communication. The potential result is enhanced communication at a time and place convenient to both the instructor and the student.

In the following sections, we describe the degree to which current Web-based syllabi facilitate communication among instructors, students, and practitioners or other individuals not directly connected to the university environment. Each cell of the matrix is considered.

4. The influence of instructors

Information from instructors can flow to three categories of individuals—to students, to other instructors, and to practitioners/experts.

4.1. Instructors communicating with students

Traditionally, the syllabus has been a tool for the instructors to communicate information to the students. The conventional photocopied syllabus is unidirectional wherein the information flows from the instructor to the students. As we enter the communication age, new forums for transmitting such information are emerging. Current versions of major word processing programs allow Web-based syllabi to be created without knowledge of Hypertext Markup Language (HTML). All that is necessary today is to select an HTML "save as" option. Once accomplished, course information is available for student review, instructor demonstration, and college comparison and evaluation. It is from here that greater course content discussion and reflection can evolve. At the same time, while placing a copy of the syllabus on the Web allows students and colleagues access to the information, it is still a minor variation on a photocopied syllabus available from the department secretary.

As such, it was not surprising that instructor to student information transfer was the most dominant use of electronic syllabi found in the World Lecture Hall. Approximately 70% of the Web-based syllabi analyzed included a schedule of assignments as well as a profile of the instructor (see Table 2). However, only slightly more than 10% had class rosters with lists of students who were members of the class. When a class roster was available, however, it usually included students' e-mail addresses.

Beyond simple information sharing provided in an online syllabus and course roster, some instructors might move up the Web integration continuum by placing substantive portions of their classes online (see Bonk et al., 2000). Nevertheless, the mere posting of lecture notes and PowerPoint slides on the Web is little more than a convenient way to access photocopies of instructional material. In addition, posting sample tests or case examples may not result in students utilizing this material to enhance their learning or course understanding. Such criticisms or cautionary statements do not mean that it is undesirable to provide online course materials to students, colleagues, and practitioners. On the contrary, such resources are extremely valuable and faculty members deserve recognition for their efforts here. Many students benefit from having instructor annotations and anecdotal comments for listening to lectures, as well as visual representations of information presented in class. In our analyses, lecture notes and/or Power Point slides were accessible from 43% of the syllabi.

Table 2
Percent of online syllabi with different options for communication flow among instructors, students, and practitioners/experts

	To students	To instructors	To practitioners/experts
From instructor	Assignment schedule (70%)	Online syllabi (100%)	Online tutorials (3%)
	Class roster (10%)	Web forums or discussions on course material (4%)	General information (1%)
	Lecture notes/PowerPoint slides (43%)	Lecture notes/activities (43%)	
	Web links (70%)		
	Instructor profiles (70%)		
From students	Post or publish current student work (14%)	Journal reflections (6%)	Web links (13%)
	Within-course discussions or electronic conferences (65%)	Online quizzes/tests (38%)	Resumes on the Web (0%)
	Outside of course discussions (5%)	Reflective electronic minute papers (0%)	
	Personal profiles (10%)	Session evaluations (3%)	
		Instructor email feedback (84%)	
From practitioners/ experts	Jobs (0%)	Course feedback (0%)	Virtual professional development communities (0%)
	Virtual field trips (5%)		

In addition to syllabi and lecture notes, in traditional face-to-face university classes, instructors frequently direct students to various local resources during the first class session. Typically, these local resources include readings placed on reserve in the library, curriculum materials available from a given local center, or supplemental resources from the textbook company. Reviewing syllabi at the World Lecture Hall indicates that using the Web to store, filter, and select information for students is, not surprisingly, a fairly common practice for college instructors. Web links from one's syllabus or course homepage can provide students with starting points for meaningful course activities or instructional journeys. For example, if the instructor wishes to have students participate in an online test of logical thinking, they can be directed to a site developed by faculty at the University of Zurich's Experimental Psychology Lab (see http://www.psych.unizh.ch/genpsy/Ulf/Lab/WebExpPsyLabAnim.html). At the same site, students also can participate in experiments involving perception, decision making, visual encoding, and memory.

While instructors can incorporate the Web to direct or guide students' instructional focus outside of regular class time, having preselected links on an electronic syllabus might also be useful within the context of a live class presentation. Placing the University of Massachusetts-Amherst link (see http://www.umass.edu/arthist/links.html) on an art class syllabus, for example, allows the instructor access to images from more than 100 museums from around the world. In a classroom equipped with Internet access, the instructor could respond to a student's question by using the syllabus to locate the Web site of the Louvre. A particular painting or sculpture can be displayed to illustrate a concept. In a matter of seconds, the students in the class can be transported from Paris to Madrid and then just as quickly to the Metropolitan Museum of Art in New York. Of course, this is just one signal of the shifting role of the instructor from that of information dispenser to one of information filterer, trip planner, and expedition leader.

In our analyses of the 79 syllabi, Web links to external sites were present within 70% of the syllabi. Such links directed students to program requirements, as well as department, school, library, and local community resources. In effect, instructor-selected Web links serve as one way to facilitate information access for students. Links to other online items (e.g., journals, books, and listservs) connect students to still additional information and communication resources. Rather than thinking of the clustered resources of a campus setting, instructors are employing the Web to allow access to resources worldwide.

4.2. Instructors communicating with other instructors

The use of the World Lecture Hall as the vehicle for locating syllabi for inclusion in the analysis meant that 100% of the instructors communicated with other instructors, at least on a minimal level by sharing their syllabi at this site. They each requested that their syllabus be posted in the Hall.

However, of the 79 Education syllabi meeting our criteria, only 4% had links to Web sites that allowed instructors to communicate with other instructors using the same textbook or teaching the same course. Tools intended to foster online communities of instructors were not widely available or used. Worse still, only one syllabus incorporated a link inviting other instructors to participate in his or her class.

4.3. Instructors communicating with practitioners/experts

The education syllabi from the World Lecture Hall indicate that most instructors are not using Web-based syllabi as vehicles to communicate with practitioners or external experts. While a mere two syllabi (2.5%) had online tutorials that were relevant for practitioners, only one site out of 79 (1.3%) included information directed toward practitioners. The communication that did occur here, not surprisingly, was in the form of research articles and products for field application.

5. The influence of students

A Web-based syllabus allows more than a unidirectional flow of information emanating from the instructor. For instance, it also allows for students to transfer information back to the instructor, to interact with their student peers, and, finally, to establish links with researchers, experts, and practitioners.

5.1. Students communicating with instructors

The Web provides a convenient medium for students to communicate or send feedback to the instructor about their progress within the course. Among the many options for student electronic course feedback are e-mail messages, reflection papers, quizzes and tests, and various types of input forms (e.g., surveys, questionnaires, and profiles) to collect students' perspectives.

With the exception of e-mail to the instructor, the majority of instructors are not using the electronic syllabus as a tool to facilitate information flow and feedback from their students. Approximately 84% of the instructors included their e-mail address as an active link. This practice allowed students to click on a spot in the syllabus and send electronic information to the instructor. However, in just 6.3% of the syllabi analyzed, students were encouraged to submit comments or journal reflections on aspects of the course to the instructor. This is unfortunate since student online reflections allow adjustments or modifications to be made to a course while it is in progress.

None of the instructors had links in their syllabi for students or other users to provide anonymous feedback about the instructor or course or to solicit information about a given class session. Nevertheless, it is possible to create anonymous HTML forms for students to send feedback on one's course without the anxiety that their name would be connected to a particular concern or negative comment. For example, one might use the ''1-min paper'' (Angelo & Cross, 1993) to gather information about a recent class discussion or synchronous guest expert. Brief questions may be designed to elicit succinct online responses. Essentially, responses that can be composed in roughly a minute or two. Given the informative and simple nature of this activity, it was surprising that none of the syllabi we evaluated incorporated 1-minute electronic student reflections. Still, a small percentage of instructors (2.5%) included access to forms that permitted students to give objective feedback on particular class sessions.

Tests also help instructors gauge the degree to which certain individuals or an entire class has mastered key course concepts. Naturally, there are various concerns regarding online testing. For instance, there are questions related to who actually tool an online quiz, as well as potential serial effects of students informing friends what was on the quiz. Althauser and Matuga (1998) describe a solution to the latter problem by using a random draw of questions from a large test item bank. In terms of the first issue, one might use proctored exams. Alternatively, those advocating a more sociocultural view might employ open note, collaborative, and time-unrestricted quizzes since the cognitive benefits of such an approach may actually outweigh the potential costs associated with student collusion and dishonesty (Bonk, 1998).

Quizzes and/or tests associated with the course were included in 38% of the syllabi we analyzed; a number that is bound to increase as online quiz tools become more user friendly and cost effective. For the most part, online syllabi allowed students to access required quizzes and/or tests from a Web link. Online course or instructor evaluation forms offer advantages over the paper-and-pencil scantron versions. For instance, when evaluations are submitted via the Web, the keyboard input eliminates handwriting as a factor in identifying the author. Second, if the Web components of the course are supplemental to a face-to-face course, Web assessments may be conducted without siphoning off-needed class time. In addition, by requiring completion of the evaluation prior to the submission of the course grades, all students will participate in course evaluations. Fortunately, common evaluation software can track who has and who has not submitted their evaluations (Hmieleski & Champagne, 2000). Of course, if this is a hybrid class with face-to-face as well as online components, online evaluations will allow individuals who are absent from class to have an additional opportunity for course evaluation and feedback.

5.2. Students communicating with students

Electronic conferencing forums provide an opportunity for students to interact with each other, with the instructor, or anyone who has access to the forum. The interaction can be asynchronous, meaning that the discussants need not be present simultaneously. One student may post at 2:00 p.m. while another may reply to the first student at 2:00 a.m. the following day. Equally important to the time-independent nature of asynchronous conferencing, such student interaction may come from students located in other countries and locales. In our study of education syllabi, the most common form of student-to-student communication took place on listservs or in electronic forums. For instance, in 64.6% of the syllabi, there were electronic discussions within the course. As Fetterman (1996) observed, the class is no longer "place based" and participant restricted.

In addition to online forums, students might also interact with one another through online cafes, personal profiles, Web-link suggestions, survival stories, and electronic profiles. Creating electronic profiles, for instance, allows students to share personal information with each other (e.g., hobbies, interests, strengths, weaknesses, major(s), and other personal data). Unfortunately, while instructors provided links to their personal profiles almost 70% of the time, opportunities to create or link to student profiles were present in less than 10% of the online syllabi.

To facilitate content-related interactions among students, 13.9% of the course Web sites allowed students to post or publish their work on the Web. Additional work is needed in this area, however. For instance, more sophisticated Web interaction tools allow students to comment on each other's profiles or postings and work in teams to create richer representations of knowledge, thereby perhaps fostering a sense of community advocated by Roschelle and Pea (1999).

These syllabi offered several opportunities for online discussions with students who were in different universities or in different sections of the same course in which the students were enrolled. However, this was a relatively rare practice, taking place in less than 5% of the education syllabi evaluated. In effect, as important as student online collaboration might be, our analyses of courses in the World Lecture Hall revealed that such collaboration was quite limited. Perhaps the pedagogical features of computer conferencing and collaboration tools can be further developed to foster such interaction (Duffy, Dueber, & Hawley, 1998).

5.3. Student communication with practitioners/experts

In terms of student communication with practitioners or experts, the findings were somewhat less favorable. In 12.7% of the syllabi, students created Web pages that could be used by practitioners or experts. Unfortunately, none of the online syllabi incorporated features or tasks that required students to post copies of or links to their resumes. In addition to lacking resume submission, none of them facilitated conference enrollment or participation, the joining of professional organizations or associations, student requests for mentorship, or other such professional practices.

6. The influence of practitioners/experts

6.1. Practitioners/experts communicating with students

Novice and experienced practitioners can add interesting and informative perspectives to electronic course dialogue. For instance, Levin and Waugh (1998) suggest the term ''teleapprenticeships'' for improving teacher education through electronic means. Teleapprenticeship-like learning environments allow participants to have access to authentic practices and experiences (Waugh & Rath, 1995). In such environments, a novice learner participates in a remote community of professionals, first by watching the interactions and subsequently by taking a more active role (Lave & Wenger, 1991). By linking students with exemplary practitioners, students can access expert knowledge and anecdotes related to a myriad of situations and contexts.

While teleapprenticeships have been described in the online learning literature, only one instance was observed in the course requirements of the Web-based syllabi analyzed here. In fact, there was no evidence of Web-based learning communities where practitioners provided guidance to students. However, one syllabus had a virtual field trip that offered a form of

input from practitioners to students, while 5% of the syllabi had links to professional associations from which students could receive ample practitioners' perspectives. From these data, there is a clear need for the development and use of tools and tasks that foster online student apprenticeship and mentoring.

6.2. Practitioners/experts communicating with instructors

In our analyses, there was no evidence of online communication from practitioners to instructors. Most likely, relevant information from other practitioners, experts, and research-ers flows via listservs, conference bulletin boards, and direct email, but this would be out of the sight of those scanning the online syllabus. In addition, while instructors undoubtedly forward interesting e-mails from colleagues about new tasks or class activities they are using, as well as relevant listserv discussions from fellow instructors or practitioners in their fields, such acts would not likely be visible from a review of syllabi.

Given the primary focus of instructors providing information to students, it was not surprising that courses on the World Lecture Hall currently fail to facilitate communication from practitioners or experts to course instructors. While communication among practitioners/experts could develop in electronic conferences that include students and practitioners/experts, no formal evidence of this form of communication was discovered in the syllabi. In effect, an opportunity to connect practitioners/experts to one's course and to each other was not considered by these instructors.

6.3. Practitioners/experts communicating with other practitioners/experts

Evidence of practitioners or experts communicating with other practitioners or experts, such as in virtual professional development communities, was not found in any of the 79 education syllabi analyzed in this study. Again, it should be noted that this form of communication is not currently part of one's conceptualization of a college syllabus. Perhaps this will soon change.

7. Interpretation of results

One interpretation of the findings here would be that university instructors on the whole have failed to take advantage of the dynamic features of the Web. The majority of educational syllabi submitted to the World Lecture Hall are little more than photocopied syllabi. In effect, instructors are employing the Web to support traditional classroom structures. Such electronic replication of live classroom activities may signal that most college instructors still do not understand the pedagogical potential of Web-based instruction (Bonk & Dennen, in press). At the same time, such findings also stem from Web-based courseware that is overly administrative and lacking in useful instructional templates and activities (Bonk & Dennen, 1999). Small wonder there are so many critiques and cautions related to Web-based instruction appearing in higher education journals.

It is likely that most college instructors have yet to fathom the new interaction possibilities that the Web now affords. Why? Perhaps most instructors do not work in environments supportive of more interactive Web experiences. Or, perhaps sound pedagogical tools have yet to be designed for the Web. Equally plausible, perhaps college instructors simply lack the time and funding to venture into this area (Bonk, 2001). Most likely, the problem relates to many of these factors and more.

Of course, such conclusions must be tempered by at least four factors. First is the infancy of the Web. Compared to traditional print forms of communication, the Web is a brand new vehicle for exchanging text, video, and audio information. Commercial Web tools, such as electronic conferencing systems, have been available for less than a decade. Significant changes in syllabi and instructional practices will require many years of experimentation and idea exchange. A second reason to temper a pessimistic interpretation of the findings is that some instructors may be using Web-based activities that are not directly accessible from their syllabi. Moreover they might create Web-based assignments after the semester has begun. Thus, the present set of syllabi may not yield a complete picture of Web-based activity in colleges of education or in other disciplines and subject areas. Another limitation is that there are likely hundreds of pedagogical innovations—many of which are likely described in one's professional literature—by authors whose syllabi have yet to be submitted to the World Lecture Hall or that have been posted to domains other than education. Finally, the type and degree of Web experimentation may be contingent on whether the course experience is (1) face-to-face with a supporting Web syllabus, (2) face-to-face with some supporting Web resources, (3) embedded with both online and face-to-face tasks and activities (i.e., a hybrid course), or (4) fully online. Unfortunately, we could not differentiate the 79 syllabi analyzed here into these four categories (for additional categories or levels of Web integration, see Bonk et al., 2000).

Rather than conclude that the Web syllabi in the current study reveal a unidirectional flow of information from instructor to students, a lack of interaction among students, and business as usual within the university classroom, we prefer to discuss the outliers wherein there were innovative uses of the Web. The syllabi of these instructors provided key indicators of what may become the next generation of dynamic tools for communication. For example, some instructors incorporated peer feedback mechanisms, small group work, student generation and submission of online work, and online activities, such as debates and role-play. Given these significant instructional developments over just a few years of Web existence, it is difficult to predict what additional Web-based interaction tools will exist 5–10 years from now.

Another framework for thinking about Web-based instruction is to view it from a sociocultural perspective (Rogoff, 1990). For instance, Web-based instruction offers a chance for students to enter into dialogues about authentic problems, collaborate with peers, negotiate meaning, become apprenticed into their field of study, enter into a community of experts and peers, and generally be assisted in the learning process. The emphasis is on creating a shared space wherein students build intersubjectivity and common knowledge (Bonk & Cunningham, 1998). As indicated earlier, students might create and comment on personal profiles and portfolios. They also might form satellite discussion groups (Chong,

1998), offer mentoring support (Bonk, Malikowski, Angeli, & East, 1998), and provide peer reviews as critical friends, e-mail pals, or Web buddies (Bonk, 1998). Of course, tools for building, sharing, and negotiating knowledge are still in their infancy.

There are other frameworks for thinking about the Web. For instance, in many ways, the Web is a complex reading and writing tool. As a writing tool, the instructor can embed opportunities for student reflective writing and journaling, summary writing, article discussions, case creations and discussions, brainstorming, role-play and debates, peer commenting, minute papers, etc. For an instructor, such intensive and extensive opportunities for writing are simultaneously daunting and exciting. However, if writing is important to thinking (Langer & Applebee, 1987), then the Web holds promise in exercising the minds of students. From a reading standpoint, students are constantly navigating text and visual resources, combing through peer comments and course contributions, browsing expert resources, and receiving instructor or mentor feedback. Fortunately, as the Web evolves into a familiar reading, writing, and communication tool, there should be innumerable ways to foster interactions between course participants.

8. From World Lecture Hall to course sharing

One form of interactivity facilitated by the Web and associated electronic listservs are communications that take place among instructors of different universities and across instructors of administratively diverse departments within a single university. A review of online courses in the World Lecture Hall, however, reveals the tendency of instructors to create entire courses from scratch, unit by unit. Will instructors continue to work alone in their creation of online courses and materials or will they utilize the collegial structures and feedback mechanisms of the Web?

A recent study by Bonk (2001) revealed that online teaching and learning in the coming decade will be increasingly characterized by more collegial sharing and teaching collaborations across universities. When this occurs, an instructor may decide to use a particular unit developed by a colleague. The unit might be adopted as is or modified to meet the unique demands of his or her particular course or discipline. Universities and colleges, too, will need to share such electronic courses, perhaps by using local expertise to create globally marketed classes as well as "hiring" international talent to deliver courses locally. Amazingly, Bonk's study indicates a fivefold increase in freelance instructors for online courses in just the next 5 years.

There are many emerging opportunities within online instruction and parallels calls for caution. Today, the study of the nuance of voice, facial expression, and speech of educational legends calls into question concerns about the computer causing language erosion and the flattening of perspective. Despite such opportunities, devoted bibliophiles regret the passing of the print-only medium, resent the pressure of the ubiquitous "digital" culture, and pine for the good old days when one used to have a more intimate interaction with a book (Harris, Harris, & Hannah, 1998). However, imagine what Plato or Socrates might have produced with the digital video, audio, and hypertext tools linked to a worldwide library. Which of

these technologies or opportunities would have intrigued them the most? In addition, which might have overwhelmed them?

Has the time of the photocopied syllabus past? Will the photocopied syllabus go the way of the hand-copied manuscripts shortly after Gutenberg revolutionized communication with the printing press? Half a millenium later, the Web offers access to the world's largest library, a library without walls that is not place based. Our challenge is to find ways to redefine academic communities as we know them. The communities are no longer place- or time-based by necessity. With current Internet capabilities, the ability to communicate in meaningful ways with distant colleagues is enhanced. At the same time, we are clearly not exploiting this potential when it comes to the delivery of course information and the electronic generation of course syllabi and events.

As one peruses the catalog of college and university course home pages at the World Lecture Hall and projects 5–10 years ahead, it becomes apparent the term "lecture hall" may be extremely appropriate today but not for long. While most "online" courses provide no more than a traditional syllabus and standard lecture materials, others certain indicators of how the next generation of college syllabi may offer dynamic tools for communication (Bonk, 1998; Owston, 1997). In fact, as we head in the 21st century, the notion of an online "World Lecture Hall" might give way to interactive instructor communities centered around the notion of sharing course information and ideas. When this occurs, course sharing might become a more vital component of one's resume than course lecturing.

Is there any merit in this notion of course sharing? As a recent survey of corporate trainers by Bonk (in press) revealed, many online instructors are keenly interested in the notion of reusable knowledge objects. Nearly 70% of the organizations surveyed were interested in the use of knowledge objects. With such tools, instructors can share course-related animations, images, video clips, lectures, simulations, diagrams, graphs, and other course materials with other online instructors (Wiley, 2001).

According to various scholars, the metatagging of those knowledge bits, which are stored in XML format, will allow learners to find reusable knowledge and information quickly and efficiently (Barron, 2000; McGreal, 2001; Schatz, 2000). Currently, a consortium of organizations is assisting in building shareable courseware and associated standards (Windman, 2001). In these efforts, the Department of Defense has created—through its Advanced Distributed Learning (ADL) Co-Laboratory Network (see http://www.adlnet.org/)—a standard called SCORM (Sharable Content Object Reference Model). Among the goals of SCORM is to "organize, encourage, orchestrate, and document" the development of learning objects (Fletcher & Dodds, 2000). When complete, learning objects are expected to be usable, accessible, adaptable, manageable, reusable, reliable, durable, affordable, and interoperable (Hodgins & Conner, 2000; McGreal, 2001). Already, organizations, such as Brigham Young University (South & Monson, 2001) and the University of Wisconsin (Brown & Meachen, 2000), are developing plans and visions to take advantage of the potential of learning objects. Clearly, then, the movement from sharing syllabi in online lecture halls to course sharing within and across universities and other organizations is very real.

In the midst of this movement toward shareable courseware, what can be done to invite more instructors to post more interactive syllabi or task examples to the Web? What

incentives might be offered to share course components and useful learning objects? One solution is to create online virtual communities for instructors teaching the same course or using the same book. With Web tools for sharing syllabi, successful class projects, Web links, and instructor profiles (e.g., see CourseShare.com), college instructors might be more inspired to create and share dynamic syllabi and knowledge objects with their newfound global colleagues. Indeed, a unique learning community with similar pedagogical needs may emerge. Additionally, universities can encourage instructors to design richer electronic resources for the Web through external grants and mentoring programs. While tools like the World "Lecture" Hall are a start, perhaps with greater understanding of the electronic interactions possible with the Web and the continued design of new communication and collaboration tools, this electronic place may evolve into "The World Interaction Hall" or "The World Communication Hall."

9. Conclusions

As the potential for infusing so many resources and meaningful linkages into a single course increases, we soon will need to rethink the standard three-credit college course as well as unnecessary conventions and political baggage of traditional college instruction. Pressing considerations include the technical support afforded to the instructor, the time and resources required to develop and reflect on one's pedagogical practices, and the changing expectations of the college student. Of course, we must find new ways to foster interdisciplinary sharing of best practices and success stories that can enhance and enrich Web-based instruction of all online instructors. For example, problem- and case-based approaches, as well as online discussion and small group activities, often draw on faculty experience across traditional departmental lines.

Such opportunities are bound to proliferate as the bandwidth provided by the Internet II allows full motion video that supplements text and still images in many Web-based courses. In addition, as groupware tool features improve, collaborative partnerships with students around the world will be increasingly ubiquitous. At the same time, pedagogical improvements in Web-based course work will increasingly entice instructors to experiment with online learning activities and interactions. The possibilities for changing one's syllabus and transforming one's teaching appear endless.

Few things are certain about the teaching and learning in the 21st century. One obvious certainty is that there will be new players in the educational process and new forms of interaction among those participants. As online classrooms evolve, students, instructors, and practitioners will all take on new learning and instruction roles. It is also certain that more powerful Web-based courseware and conferencing tools will be developed that will be more user friendly and inviting for both students and instructors. Third, it is certain that our syllabi will become increasingly dynamic, plastic, borrowed, and the subject of intense discussion, debate, and controversy. As such, it is a safe bet that current discussions about what constitutes high-quality teaching and learning will extend far into the next century. Hopefully, upcoming Web development will widen the range of participants,

the forms of instruction, the degree of interaction, and the types of syllabi we will en-
counter in the 21st century.

References

Althauser, R., & Matuga, J. (1998). On the pedagogy of electronic instruction. In C. J. Bonk, & K. S. King (Eds.), *Electronic collaborators: learner-centered technologies for literacy, apprenticeship, and discourse* (pp. 183–208). Mahwah, NJ: Erlbaum.

Angelo, T. A., & Cross, K. P. (1993). *Classroom assessment techniques* (2nd ed.). San Francisco: Jossey-Bass.

Barron, T. (2000, March). Learning object pioneers. *Learning circuits.* American Society for Training and Development. Available at http://www.learningcircuits.com/mar2000/barron.html. Retrieved December 1, 2001.

Bonk, C. J. (1998, April). *Pedagogical activities on the "Smartweb": electronically mentoring undergraduate educational psychology students.* Paper presented at the American Educational Research Association Annual Convention, San Diego, CA. Available at http://php.indiana.edu/~cjbonk/paper/smart_paper.html. Retrieved December 2, 2001.

Bonk, C. J. (2001). *Online teaching in an online world.* Bloomington, IN: CourseShare.com. Available at http://courseshare.com/Reports.php. Retrieved December 1, 2001.

Bonk, C. J. (in press). *Online training in an online world.* Bloomington, IN: CourseShare.com. To appear at http://PublicationShare.com.

Bonk, C. J., & Cummings, J. A. (1998). A dozen recommendations for placing the student at the center of Web-based learning. *Educational Media International*, *35* (2), 82–89.

Bonk, C. J., Cummings, J. A., Hara, N., Fischler, R., & Lee, S. M. (2000). A ten level Web integration continuum for higher education. In B. Abbey (Ed.), *Instructional and cognitive impacts of Web-based education* (pp. 56–77). Hershey, PA: Idea Group Publishing.

Bonk, C. J., & Cunningham, D. J. (1998). Searching for learner-centered, constructivist, and sociocultural components of collaborative educational learning tools. In C. J. Bonk, & K. S. King (Eds.), *Electronic collaborators: learner-centered technologies for literacy, apprenticeship, and discourse* (pp. 25–50). Mahwah, NJ: Erlbaum.

Bonk, C. J., & Dennen, V. P. (1999). Teaching on the web: with a little help from my pedagogical friends. *Journal of Computing in Higher Education*, *11* (1), 3–28.

Bonk, C. J., & Dennen, N. (in press). Frameworks for frameworks in Web instruction: fostering research, design, benchmarks, training, and pedagogy. To appear in M. G. Moore, & B. Anderson (Eds.), *Handbook of distance education.* Mahwah, NJ: Erlbaum.

Bonk, C. J., Kirkley, J. R., Hara, N., & Dennen, N. (2001). Finding the instructor in post-secondary online learning: pedagogical, social, managerial, and technological locations. In J. Stephenson (Ed.), *Teaching and learning online: pedagogies for new technologies* (pp. 76–97). London: Kogan Page.

Bonk, C. J., Malikowski, S., Angeli, C., & East, J. (1998). *Web-based case conferencing for preservice teacher education: electronic discourse from the field. Journal of Educational Computing Research*, (*19* (3), pp. 267–304). Englewood Cliffs, NJ: Educational Technology Publications.

Bonk, C. J., & Reynolds, T. H. (1997). Learner-centered Web instruction for higher-order thinking, teamwork, and apprenticeship. In B. H. Khan (Ed.), *Web-based instruction* (pp. 167–178). Englewood Cliffs, NJ: Educational Technology Publications.

Brown, J., & Meachen, E. (2000). Unlocking the potential of ADL through standards: where does the UW system fit in? *Teaching with Technology Today Newsletter, 5* (8), May 17, 2000. Available at http://www.uwsa.edu/olit/ttt/jbrown.htm. Retrieved December 1, 2001.

Chong, S. M. (1998). Models of asynchronous computer conferencing for collaborative learning in large college classes. In C. J. Bonk, & K. S. King (Eds.), *Electronic collaborators: learner-centered technologies for literacy, apprenticeship, and discourse* (pp. 157–182). Mahwah, NJ: Erlbaum.

Duffy, T. M., Dueber, B., & Hawley, C. L. (1998). Critical thinking in a distributed environment: a pedagogical base for design of conferencing systems. In C. J. Bonk, & K. S. King (Eds.), *Electronic collaborators: learner centered technologies for literacy, apprenticeship and discourse* (pp. 51–78). Mahwah, NJ: Erlbaum.

Fetterman, D. M. (1996). Videoconferencing on-line: enhancing communication over the Internet. *Educational Researcher*, *25* (4), 23–27.

Fetterman, D. M. (1998). Webs of meaning: computer and Internet resources for educational research and instruction. *Educational Researcher*, *27* (3), 22–30.

Fletcher, J. D., & Dodds, P. (2000, May). All about ADL. *Learning circuits.* American Society for Training and Development. Available at http://www.learningcircuits.com/may2000/fletcher.html. Retrieved December 1, 2001.

Harris, P. C., Harris, M. H., & Hannah, S. A. (1998). Confronting hypertext: exploring divergent responses to digital coursework. *The Internet and Higher Education*, *1* (1), 45–57.

Hmieleski, K. M., & Champagne, M. V. (2000). Plugging in to course evaluation. *Technology source.* Available at http://horizon.unc.edu/TS/assessment/2000-09.asp. Retrieved December 1, 2001.

Hodgins, W., & Conner, M. (2000, Fall). Everything you ever wanted to know about learning standards but were afraid to ask. *Learning in the New Economy e-Magazine (LiNE Zine).* Available at http://www.linezine.com/2.1/features/wheyewtkls.htm. Retrieved December 1, 2001.

Langer, J. A., & Applebee, A. N. (1987). *How writing shapes thinking: a study of teaching and learning*. Urbana, IL: National Council for Teachers of English.

Lave, J., & Wenger, E. (1991). *Situated learning: legitimate peripheral participation*. New York: Cambridge University Press.

Levin, J., & Waugh, M. (1998). Teaching teleapprenticeships: electronic network-based educational frameworks for improving teaching education. *Interactive Learning Environments*, *6* (1–2), 39–58.

Malikowski, S. (1997). Interacting in history's largest library: web-based conferencing tools. In B. H. Khan (Ed.), *Web-based instruction* (pp. 283–294). Englewood Cliffs, NJ: Educational Technology Publications.

McGreal, R. (2001, October). A primer on metadata: fostering an interoperable environment. *E-learning*, *2* (10), 26–29.

Mergendoller, J. R. (1996). Moving from technological possibility to richer student learning: revitalized infrastructure and reconstructed pedagogy. *Educational Researcher*, *25* (8), 43–46.

Owston, R. D. (1997). The World Wide Web: a technology to enhance teaching and learning? *Educational Researcher*, *26* (2), 27–33.

Rogoff, B. (1990). *Apprenticeship in thinking: cognitive development in social context*. New York: Oxford.

Rogoff, B. (1995). Observing sociocultural activity: participatory appropriation, guided participation, and apprenticeship. In J. V. Wertsch, P. D. Rio, & A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 139–164). New York: Cambridge University Press.

Roschelle, J., & Pea, R. (1999). Trajectories from today's WWW to a powerful educational infrastructure. *Educational Researcher*, *28*(5), 22–25, 43.

Rud, A. G. Jr. (1997). Banality and optimism: webbed education. *Philosophy of Education.* Available at http://www.ed.uiuc.edu/EPS/PES-yearbook/97_docs/rud.html. Retrieved January 12, 2002.

Schatz, S. (2000). *Meta tagging knowledge bits: an introduction and model for creating unique schemas.* Unpublished manuscript. Indiana University Bloomington. Available at http://www.performanceportalportal.com/Tags.pdf. Retrieved December 1, 2001.

South, J. B., & Monson, D. W. (Eds.) (2001). A university-wide systems for creating, capturing, and delivering learning objects. *The Instructional use of learning objects.* Bloomington, IN: Association for Educational Communications and Technology. Available at http://reusability.org/read/chapters/south.doc. Retrieved December 1, 2001.

Tharp, R., & Gallimore, R. (1988). *Rousing minds to life: teaching, learning, and schooling in social context*. New York: Cambridge University Press.

Waugh, M., & Rath, A. (1995). Teleapprenticeships in an elementary science methods class: a description of students' network experiences. *Journal of Computers in Mathematics and Science Teaching*, *14* (1–2), 77–92.

Web-based Education Commission. (2000). *The power of the Internet for learning: moving from promise to practice*. Washington, DC: U.S. Department of Education. Available at http://interact.hpcnet.org/webcommission/index.htm. Retrieved December 1, 2001.

Wiley, D. A. (Ed.) (2001). Connecting learning objects to instructional design theory: a definition, a metaphor, and a taxonomy. *The instructional use of learning objects*. Bloomington, IN: Association for Educational Communications and Technology. Available at http://reusability.org/read/chapters/wiley.doc. Retrieved December 1, 2001.

Windman, R. (2001). Lessons learned, SCORM product development. *e-Week*, May 14, 2001. Available at http://www.zdnet.com/eweek/stories/general/0,11011,2717915,00.html. Retrieved December 2, 2001.

Windschitl, M. (1998). The WWW and classroom research: what path should we take? *Educational Researcher*, *27* (1), 28–33.