

# 23

## Frameworks for Research, Design, Benchmarks, Training, and Pedagogy in Web-Based Distance Education

Curtis J. Bonk  
*Indiana University*  
cjbonk@indiana.edu

Vanessa Dennen  
*San Diego State University*  
vdennen@mail.sdsu.edu

### INTRODUCTION

Administrators in higher education face decisions about what resources, activities, tools, partners, and markets are important to Web-based courses. Decisions in these areas can dramatically impact the effectiveness of Web-based instruction.

It is our premise here that, before forging ahead with new partnerships and marketing initiatives, an overall plan or perspective as well as many subplans or ideas for Web-based learning<sup>1</sup> are needed. Consequently, in this chapter, we provide a set of frameworks from which to reflect e-learning practices and opportunities. Additionally, we detail a number of pedagogical practices intended to make the frameworks come alive.

### COLLEGE INSTRUCTOR ONLINE LEARNING SURVEY

A recent survey of college faculty cosponsored by JonesKnowledge.com and CourseShare.com found that the barriers to e-learning in most college settings included time to learn the technology, shortages of instructional development grants and stipends, limited recognition by departments and institutions in promotion and tenure decisions, and minimal instructional design support (Bonk, 2001). According to this study, recognition, collaboration, technical support, online sharing of pedagogical practices, and instructional design assistance are all ways to increase the adoption of Web-based technologies in college teaching. Such findings

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<sup>1</sup>In this chapter, we interchangeably use the terms *online learning*, *Web-based learning*, and *e-learning*. Such terms refer to online instruction and distance learning made possible by the World Wide Web.

are important to administrators struggling with how to jump-start faculty technology integration within their universities and departments.

This study also determined that respondents—who, for the most part, were early adopters of the Web and had posted course syllabi, personal profiles, or Web resource reviews to either MERLOT.org or the World Lecture Hall on the Web—are finding a myriad of ways to incorporate the Web in their teaching. In fact, more than half of the faculty in this study had posted online syllabi and lecture notes, used online cases or problems, established asynchronous discussion forums in their classes, tried out different search engines, utilized articles and journal links, and found online glossaries for their classes. What they still wanted, however, were more pedagogical tools, advice, and communities for their online teaching and learning efforts. Not only did they request additional instructional development advice, technical support, release time, and course development stipends, they also wanted pedagogical ideas on how to use the Web in their teaching. In particular, they asked for tools that would foster greater student critical and creative thinking in their Web-based teaching efforts. Finally, there was a felt need for online teaching guidance, mentoring, and expert answers to problems.

### PEDAGOGICAL VOID

Despite these findings of the need for pedagogical tools for the Web, most online courseware is pedagogically negligent (Bonk & Dennen, 1999). Most e-learning tools available at the time of this writing provide templates and guidelines for warehousing students and providing static course material. However, assistance in developing rich situations for collaborative knowledge construction, information seeking and sharing, reflection, debate, and problem-based learning is generally overlooked in the design of standard courseware tools.

As Oliver and McLoughlin (1999) note, there is too much focus on providing repositories of information over engineering innovative and dynamic Web-based learning experiences. They advocate guidelines for designing constructivist learning environments rich in knowledge construction experiences, social interaction, learner ownership and reflection, and opportunities to appreciate multiple perspectives. To support such guidelines, they offer frameworks for reflecting on constructivist learning principles and associated online tasks (e.g., metacognition and online journals, collaboration and various group discussion techniques, articulation and electronically sharing examples of work in progress, and active learning and the creation of Web reports or reviews of electronic resources). They also link these tasks and principles to specific tools and resources that can be designed for the Web such as URL posting, concept mapping, online surveys, note taking, and electronic debates (see also Oliver, Omari, & Herrington, 1998).

### ONLINE LEARNING SUMMARY REPORTS

As online teaching and learning takes center stage in college teaching environments around the globe, there are a number of reports and initiatives to help administrators, instructors, politicians, and funding agencies make sense of the opportunities that the Web presents. For example, a recent report by the Institute for Higher Education Policy (2000) identified 24 key benchmarks for online learning quality related to course development, material reviews, student interaction and feedback, access to resources, technical support, student advisement, and the evaluation of learning outcomes. Similarly, a report from Pennsylvania State University and the AT&T Foundation detailed a set of guiding principles and practices for the design and development of distance education (*Innovations in Distance Education*, 2000). Other papers and Web sites document the Web courseware technologies and collaborative tools confronting

institutions for decisions and directions. Such technologies multiply the opportunities and challenges facing higher education (Gray, 1998, 1999; Looms, 2000).

Some clarity is emerging. A report from a year-long faculty seminar on online teaching and learning at the University of Illinois reviewed the types of students and instructional methodologies typically found in online environments (The Report of the University of Illinois Teaching at an Internet Distance Seminar, 1999). Their review pointed to aspects of high-quality teaching in online environments and led to various recommendations for faculty related to facilitating online learning and guiding student interactions. A report from the TeleLearning Network Centers of Excellence (TeleLearning NCE) of Canada compared eight key postsecondary institutions offering e-learning in a competitive analysis of course/programs, pedagogy, and learner support (Massey & Curry, 1999). In this report, Massey and Curry provided a preliminary analysis of universities emerging in this field such as Stanford University, Nova Southeastern, Western Governors University, Indiana University, the University of Illinois, Open University UK, University of Phoenix Online, and California Virtual University. In addition, they addressed expansion plans, marketing, faculty, learners/clients, and course production and delivery. Such reports provide useful insights into the direction of online technologies and course delivery.

Other distance learning reports look at the existing research. For example, Bonk and Wisher (2000) extensively documented the online learning research literature and then detailed a set of experiments that address the gaps in the current research. In contrast, Russell (1999) summarized the nonsignificant results of distance learning research since 1928 as well as a scant few studies that actually indicate some positive and negative differences. Still other reports note that distance learning research too often lacks reliable and valid testing instruments and neglects theoretical grounding (National Center for Education Statistics, 1999; Phipps & Merisotis, 1999; Wisher, et al., 1999). Many such reports also point out that distance learning fails to account for the higher drop-out rates experienced in Web-based instruction.

### ONLINE LEARNING FRAMEWORKS

The documentation of online learning quality benchmarks, tools, market trends, competitive analyses, and research gaps within these reports simply touches the surface of the types of studies needed for enhancing Web-based teaching and learning in higher education settings. Moreover, actual studies of faculty teaching via distance learning marginally address the pedagogical aspects of this new teaching and learning environment, opting instead to focus on issues of satisfaction, compensation, ownership, course load, and job security (e.g., National Educational Association, 2000). Consequently, there is a growing need for pedagogical frameworks for considering the Web in one's teaching.

Higher education faculty and administrators need useful frameworks for utilizing the Web in instruction. A series of research studies (Bonk & King, 1998) and online course experiments (Bonk, 1998; Bonk, Fischler, & Graham, 2000; Bonk, Hara, Dennen, Malikowski, & Supplee, 2000) at Indiana University spurred the development of various online learning frameworks.<sup>2</sup> Some of these studies explored the forms of learning assistance and mentoring found in online learning environments (Bonk & Sugar, 1998; Kirkley, Savery, & Grabner-Hagen, 1998) and the structure of online tasks (Dennen, 2000). Others have investigated online case creation and mentoring with preservice teachers (Bonk, Daytner, Daytner, Dennen, & Malikowski, in press; Bonk, Hara et al., 2000; Bonk, Malikowski, Angeli, & East, 1998; Bonk, Malikowski, Angeli, & Supplee, 1998).

<sup>2</sup>Many of these frameworks have been more fully reported elsewhere; see articles cited for more details.

**TABLE 23.1**  
 Framework of the Effects of Instructional Frameworks for the Web on Practical Online Learning Initiatives

Instructional Frameworks for the Web	Online Learning Initiatives				
	1. Research Agendas	2. Tool Development Initiatives	3. Instructional Design Benchmarks	4. Instructor Training Programs	5. Pedagogical Guidelines, Reports, Resources, and Materials
<b>1. Psychological Justification</b>	Guides research	Justifies tool design	Provides benchmark criteria	Use as theoretical basis in training	Guides pedagogy
<b>2. Participant Interaction</b>	Variable as well as outcome of research	Influences tool design	Embedded in benchmarks	Provides training content	Generates activity ideas
<b>3. Level of Web Integration</b>	Provides classification system				
<b>4. Student and Instructor Roles</b>	Variable as well as outcome of research	Influences tool design	Embedded in benchmarks	Provides training content	Generates activity ideas
<b>5. Pedagogical Strategies</b>	Variable as well as outcome of research; focuses research funding	Establishes goals for tool design and funding sponsorship	Provides benchmark criteria	Provides training content	Generates activity ideas

Using much of this research as a base, Bonk and his colleagues have outlined five Web-based instruction frameworks relating to (1) psychological justification of online learning; (2) participant interaction; (3) levels of Web or technology integration; (4) instructor and student roles; and (5) pedagogical strategies. When combined, these five factors address issues pertaining to the overall learning environment and sense of community present in online courses. They can be used to plan, design, teach, and evaluate online courses. These general frameworks also lead to five practical initiatives: (1) focused programs of research in e-learning; (2) tool development efforts; (3) instructional design benchmarks for e-learning; (4) instructor training programs; and (5) teaching tips and guidelines. Table 23.1 demonstrates how each framework impacts and influences each practical initiative.

**Framework #1: Psychological Justification for Online Learning**

The first area of the model considers how use of the Web relates to current psychology theory. For instance, Bonk and Cummings (1998) linked 14 learner-centered psychological principles (LCPs) from the American Psychological Association (1993, 1997) to a dozen guidelines for using the Web in instruction. The LCPs, which are based on a meta-analysis of hundreds of psychological studies (Alexander & Murphy, 1994), highlight the importance of helping learners construct meaning, represent knowledge, link new information to old, monitor their own critical and creative thinking thoughts, and achieve complex learning goals. These principles also focus on how to foster student curiosity and intrinsic motivation, challenge students with appropriately high and challenging standards, recognize individual differences in learning, and nurture social interaction and interpersonal reasoning. As such, the LCPs are especially

relevant to adult distance education settings since they tend to attract adult learners who want personally meaningful activities (Wagner & McCombs, 1995) as well as instructors who are willing to experiment with and employ a variety of instructional techniques to accommodate individual student needs (Bonk, in press). Bonk and Cummings (1998) specifically linked each of their 12 practical guidelines to one or more of the APA principles:

1. Establish a safe environment and a sense of community;
2. Exploit the potential of the medium for deeper student engagement;
3. Let there be choice;
4. Facilitate, don't dictate;
5. Use public and private forms of feedback;
6. Vary the forms of electronic mentoring and apprenticeship;
7. Explore recursive assignments that build from personal knowledge;
8. Vary the forms of electronic writing, reflection, and other pedagogical activities;
9. Use student Web explorations to enhance course content;
10. Provide clear expectations and prompt task structuring;
11. Embed thinking skill and portfolio assessment as an integral part of Web assignments;
12. Look for ways to enhance the Web experience.

Each of the above 12 guidelines were linked to more than 1 of the 14 LCPs. For instance, the third recommendation on allowing students choice online related to fostering student intrinsic motivation to learn, natural curiosity, and creativity (LCP #8). It also related to the effects of motivation and guided learning on effort (LCP #9) and addressed individual differences in learning (LCP #12).

An additional psychological framework offered by Bonk and Cunningham (1998) documented collaborative learning tools from three theoretical perspectives. More specifically, Bonk and Cunningham explicated the learner-centered, constructivist, and sociocultural beliefs, principles, and approaches that inform the use of electronic conferencing and collaborative media. While detailing this framework, they point out that as educators have responded to passive, compartmentalized learning of the past century, new ways for thinking about teaching and learning have emerged. Most importantly, they explain and define key constructivist and sociocultural terminology and principles in relation to collaborative tools. For instance, new tools for online learning were linked to cognitive apprenticeship opportunities. Intersubjectivity was related to tools for building shared meaning or a temporarily shared space such as electronic whiteboards, conferencing, group brainstorming tools, and interactive debate forums (for additional explanation of such relationships, the reader is advised to read that chapter at: <http://php.indiana.edu/~cjbonk/chap2.doc>).

Similarly, Bonk (1998) linked tools and activities in an online undergraduate educational psychology course to specific sociocultural principles and techniques. Such linkages were provided for the survey course, lab experiences, and field reflection components of that course. Across these efforts, the overall intent was to clarify the psychological principles underlying different online courses and activities.

### Framework #2: Participant Interaction

This second framework offers a means to reflect on the types of interaction structures that the Web affords as well as the possible players or participants in typical online learning situations (Cummings, Bonk, & Jacobs, 2002). As noted in Table 23.2, Bonk and his colleagues document how online interactions among three key participants—instructors, students, and practitioners—should be investigated and made more explicit through the use of different media.

**TABLE 23.2**  
 E-Learning Communication Flow among Instructors, Students, and Practitioners/Experts

	<i>To Students</i>	<i>To Instructors</i>	<i>To Practitioners/Experts</i>
From Instructors	Syllabus, schedule, profiles, tasks and tests, lecture notes and slides, feedback and email, resources, course changes	Course resources, syllabi, lecture notes and activities, electronic forums, teaching stories and ideas, commentary	Tutorials, online articles, listservs, electronic conferences, learning communities, news from discipline/field, products to apply in field
From Students	Models or samples of prior work, course discussions and virtual debate information, introductions and profiles, link sharing, personal portfolios, peer commenting or evaluation	Class voting and polling, completed online quizzes and tests, minute papers, course evaluations and session feedback, reflection logs, sample student work	Resumes and professional links, Web page links, field reflections and commentary
From Practitioners/Experts	Web teleapprenticeships, online commentary and feedback, e-fieldtrips, internship and job announcements	Survey opinion information, course feedback, online mentoring, listservs	Discussion forums, listservs, virtual professional development team explorations and communities

To evaluate the types of interactions found in higher education courses, Cummings et al. (2002) evaluated a number of education syllabi posted to the World Lecture Hall (see <http://www.utexas.edu/world/lecture/>) for indicators of learning interaction. This framework opens up discussion on the types of interactions and information exchanges that are important and perhaps absent in learning. For instance, in this particular study, there was minimal practitioner involvement in one's courses.

This matrix provides an opportunity to examine how online learning tools can be used to engage different participants. As such, it widens one's views on the range of online participants, the forms of online instruction, the degree and type of interactions online, and the online environments that may soon be common. This is just one view of online interaction. For instance, Bonk, Medury, and Reynolds (1994) developed a similar framework to understand the levels of interaction fostered by synchronous and asynchronous computer conferencing and collaborative writing tools.<sup>3</sup> Collectively, such frameworks are powerful aides in tool selection and instructional design processes as well as reflection on instructional options and challenges where minimal guidelines exist.

### Framework #3: Level of Web or Technology Integration

A third model highlights ten distinctive levels of Web integration (Bonk, Cummings, Hara, Fischler, & Lee, 2000). These levels range from syllabus sharing to posting course materials on the Web, to having online discussions, to placing an entire course on the Web, to coordinating an entire program on the Web. In effect, such levels afford a useful way of examining how fully a particular course uses the Web and demonstrate a future path of integration that an instructor might work toward. Rather than simply referring to a course as a Web course or acknowledging that it has a Web presence, these levels, which, are summarized in Table 23.3, provide a way of being more specific in categorizing a Web-based course.

<sup>3</sup>Note that more than 30 synchronous and asynchronous tools were reviewed in that particular study.

**TABLE 23.3**  
 A Continuum of Web Integration in College Courses (Bonk, Cummings et al., 2000; Bonk & Dennen, 1999; Rowley, Lujan, & Dolence, 1998)

<i>Levels of Web Integration</i>	<i>Description</i>
1. Marketing/Syllabi via the Web	Instructors use the Web to promote course and teaching ideas via electronic fliers and syllabi.
2. Student Exploration of Web Resources	Students use the Web to explore preexisting resources, both in and outside of class.
3. Student-Generated Resources Published on the Web	Students use the Web to generate resources and exemplary products for the class.
4. Course Resources on Web	Instructors use the Web to create and present class resources such as handouts, prior student work, class notes, and PowerPoint presentations.
5. Repurpose Web Resources	Instructors take Web resources and course activities from one course and, making some adjustments, use them in another.
6. Substantive and Graded Web Activities	Students participate with classmates in Web-based activities such as weekly article reactions or debates as a graded part of their course requirements.
7. Course Activities Extending Beyond Class	Students are required to work or communicate with peers, practitioners, teachers, and/or experts outside of their course, typically via computer conferencing.
8. Web as Alternate Delivery System for Resident Students	Local students with scheduling or other conflicts use the Web as a primary means of course participation, with the possibility of a few live course meetings.
9. Entire Course on the Web for Students Located Anywhere	Students from any location around the world may participate in a course offered entirely on the Web.
10. Course Fits within Larger Programmatic Web Initiative	Instructors and administrators embed Web-based course development within larger programmatic initiatives of their institution.

The first five levels largely represent informational or resource repository uses of the Web, whereas the later five levels require a significantly greater time commitment on the part of students and instructors. Once at Level 6, where graded activities typically begin, there is more reliance on student interaction and instructor facilitation for online learning success. In fact, at the top three levels of Web integration, the Web becomes the primary delivery platform for the course. In Bonk, Cummings et al. (2000), not only are each of the 10 levels described with examples and key issues, but student issues and instructional design guidelines are detailed in each level (for an earlier draft, see: <http://php.indiana.edu/~cjbbonk/paper/edmdia99.html>).

This framework was designed to help educators think more deeply about the level of Web integration. Each decision about course design has long-term implications for student attitudes, social interaction, and overall learning. Reflecting on the levels of Web integration or technology use is yet another way for instructors as well as instructional designers to grasp the range of options for their online course and tool development efforts. Once a decision has been made regarding the level of Web integration, an instructor might investigate and select instructional strategies that make the Web effective at that level.

#### Framework #4: Instructor and Student Roles

The fourth framework concerns the roles of instructors and students in online learning environments. Web-based tools such as asynchronous discussion forums can be used to alter traditional instructor-led discussion formats and promote student interaction, critique, and collaboration activities based on constructivist learning theories. Students may be broken into small discussion groups, each simultaneously monitored but not necessarily run by the instructor, in

which they might assume roles such as coordinator/leader, starter or resource investigator, summarizer, secretary or scribe, advocate or encourager, specialist, implementer, and reviewer or editor of results (Bonk, Wisher, & Lee, in review). Role play is sometimes difficult for students at first, but they tend to learn more from taking responsibility for their own learning (Dennen & Bonk, in review).

While student roles may be assigned at the activity level, the online instructor must constantly shift between instructional, facilitator, and consultant roles. Mason (1991) advocated three key roles of the online instructor: (1) organizational, (2) social, and (3) intellectual. The organizational role entails setting the agenda, objectives, timetable, and procedural rules for posting and interaction. In contrast, the social role involves sending welcoming messages, thank-you notices, prompt feedback on student inputs, and a generally friendly, positive, and responsive tone. Of the three roles Mason describes, the intellectual role is the most crucial since it includes probing responses, asking questions, and refocusing discussion. It also entails setting goals, explaining tasks and overlooked information, weaving disparate comments, synthesizing key points raised and identifying unifying themes, directing discussion, and generally setting and raising the intellectual climate of the course or seminar. In effect, Mason's framework allows teachers an opportunity to reflect on the multiple roles or hats of the instructor in online courses.

In expanding on Mason's framework, Ashton, Roberts, and Teles (1999) and Berge (1995) provide a slightly different framework to document the social, pedagogical, managerial, and technological actions that instructors can use to enhance their online courses. Berge (1995) elaborates on these four instructional roles or actions to make suggestions for instructors. For instance, his pedagogical recommendations include presenting conflicting opinions and finding unifying threads, whereas the social recommendations include using introductions and accepting lurkers. While his managerial recommendations include being clear and avoiding overloads, his technical recommendations include using technical support and providing time to learn new software features. These frameworks have since been used to describe the various components of online courses (Bonk, Kirkley, Hara, and Dennen, 2002).

As is clear from Table 23.4, there are many ways to teach online courses. In Bonk, Kirkley et al. (2001), the framework is elaborated upon and more ideas are provided via stories from four different instructors who are teaching courses online. By understanding how instructors can use the Web to design and enhance student social interaction, knowledge building, higher order thinking, and reflection, we can improve learning in all types of educational environments.

### Framework #5: Pedagogical Strategies

As the growth in this area of teaching explodes, it becomes important to understand various pedagogical strategies that can be used for online teaching, such as problem-based learning (Koschmann, 1996; Dennen, 2000). However, as alluded to earlier, there is a dearth of knowledge about pedagogical tools and strategies for the Web.

Ron Oliver from Edith Cowan University in Australia is one of the few leaders in online pedagogy (Oliver & Herrington, 2000; Oliver & McLoughlin, 1999). Morton Paulsen from NKI College of Computer Science in Oslo, Norway, is one of the others (Paulsen, 1995). Oliver and his colleagues offer frameworks for thinking about instructional strategies that one might use for online teaching and learning. Their experimentation bridges technology and psychological theory by providing thinking-related templates for online tool development. For instance, they focus on how Web tools can foster student articulation, collaboration, intentional learning, and goal setting. They also connect these constructivist principles to Web-based resources such as bulletin boards, asynchronous conferencing, concept mapping, and survey tools that might be employed for student debates, reflection, cooperative group situations, and

**TABLE 23.4**  
Summary of the Pedagogical, Social, Managerial, and Technological Roles of the  
Online Instructor (Ashton et al., 1999; Berge, 1995; Bonk, Kirkley, et al., in press; Mason, 1991)

	<i>General Components and Questions</i>	<i>Examples</i>
1. Pedagogical Role	Assume facilitator or moderator role and ask questions, encourage student knowledge building, design a variety of instructional activities, elicit reflection, weave or summarize discussions, identify themes in discussions, offer constructive criticism, push to articulate ideas and explore resources, and provide explanations and elaboration where necessary	problem-based learning tasks, peer feedback tools, electronic cases, team activities, discussion forums, role play, constructive controversy, field reflections, Web site and resource evaluations, and online debates
2. Social Role	Create a friendly and nurturing environment or community feel, exhibit a generally positive tone, foster some humor, personalize in messages, display empathy and interpersonal outreach, and create community feel	cafes, digitized class pictures, online guests and visitors, jokes, and online stories or anecdotes
3. Managerial Role	Coordinate assignments with set due dates and extensions, assign groups and partners, present clear expectations, set office hours, grading and feedback, and overall course structuring	online chats, detailed syllabus, course FAQs, online gradebook and portfolios, track login data, and calendar of events
4. Technological Role	Assist participants with technology issues, clarify problems encountered, and notify when the server is down	orientation tasks, help systems, tutorials, and vote on preferred technologies

online discussions. Few scholars or tool designers understand these linkages between tools, theories, and techniques. Consequently, Oliver's leadership role is vital in promoting the Web as a learning environment based on socioconstructivist instructional design principles and practices.

Bonk and Reynolds (1997) designed a similar framework in detailing a set of instructional strategies for the Web and linking them to relevant creativity, critical thinking, and cooperative learning literature. For instance, role play, what if activities, online journals, and brainstorming tasks were linked to creative thinking; idea ranking, flowcharting, comparison and contrast, critiques and rebuttals, summary writing, and case analysis were linked to critical thinking; and group investigations, round-robins, project-based learning, Web buddy, asynchronous conferencing, and panel discussions and symposia were examples of cooperative learning tasks for the Web. In addition, the instructional approaches were linked to cognitive apprenticeship ideas and activities.

The initial pedagogical framework from Bonk and Reynolds has been extended in Table 23.5 to include motivational techniques and principles. As is shown by this table, there are many pedagogically and instructionally interesting activities available for online learning environments. For example, the Web offers a unique forum for classroom discussion, role-play, case-based discussion, brainstorming, special guest appearances, and collaborative learning.

As noted in Table 23.6, some of these pedagogical strategies heavily employ reading and writing. One popular and effective reading and writing strategy is the starter-wrapper technique (for examples, see Hara, Bonk, & Angeli, 2000). In this method, the starter summarizes the chapter ideas and issues for a particular week. The starter also provides questions meant to jump-start discussion. In the wrapper role, students reflect on issues and themes discussed during the week or unit as well as the issues that remain open. In effect, students are the teachers here. The instructor might respond within this discussion as a second wrapper by

**TABLE 23.5**  
 Online Learning Pedagogical Activities by Thinking and Learning Model  
 (Bonk & Reynolds, 1997)

Motivational and Ice-Breaking Activities	Creative-Thinking Activities
1. 8 Noun Introductions	1. Brainstorming
2. Coffee House Expectations	2. Role-Play
3. Scavenger Hunts	3. Topical Discussions
4. Two Truths, One Lie	4. Web-Based Explorations and Readings
5. Public Commitments	5. Recursive Tasks
6. Share-A-Link	6. Electronic Séances
Critical-Thinking Activities	Collaborative Learning Activities
1. Electronic Voting and Polling	1. Starter-Wrapper Discussions
2. Delphi Technique	2. Structured Controversy
3. Reading Reactions	3. Symposia or Expert Panels
4. Summary Writing and Minute Papers	4. Electronic Mentors and Guests
5. Field Reflections	5. Round-robin Activities
6. Online Case Analyses	6. Jigsaw and Group Problem Solving
7. Evaluating Web Resources	7. Gallery Tours and Publishing Work
8. Instructor- as well as Student-Generated Virtual Debates	8. E-mail Pals/Web Buddies and Critical/Constructive Friends

pointing out what topic and issues were accurately portrayed and what issues still need further discussion and clarification. He or she weaves discussion fragments while directly teaching content only when necessary. Those who are not starters or wrappers might take on various roles such as devil's advocate, pessimist, or optimist.

Of course, there are many other reading and writing techniques for online environments. For instance, students might respond to articles online in small groups or individually. They might also comment on the confusing and clear aspects of a class in a weekly minute or muddiest point paper. Such formative feedback will help the instructor make weekly shifts in class.

What about motivation? The permanency of this electronic text, however brief, and ability to comment on or revisit it are motivating aspects of online learning. Also motivating are cooperative learning techniques such as jigsaw, wherein students might divide or subdivide their learning quests and responsibilities. Students also might be sorted in pro and con groups on controversial topics for online debates. They might vote on or nominate topics or articles for these discussions. Similarly, they might post cases or topics of importance based on fieldwork or internship experiences. Student posting of cases, instead of instructor or prepackaged problems, adds to the authenticity and currency of the online classroom. As these examples indicate, no matter what the online course, there are likely many opportunities to embed reading and writing activities.

Whereas Table 23.6 focuses on reading and writing activities, Table 23.7 lists online instructional activities concerned with student interaction, publication, and community building. Activities mentioned in the table include ice breakers and closing activities, scavenger hunts, polling or voting, symposia, and online publication of student work. In terms of ice breakers, we have found that having students post eight nouns that best represent their personality or interests is usually engaging and highly informative since the first few nouns or descriptors may come easy but requiring eight nouns forces students to self-reflect and open up. Along these same lines, the critical friend, Web buddy, or e-mail pal methods, also listed in the table, are ways to encourage student interaction and direction. As such, they also extend the feedback possibilities beyond the instructor. A critical friend might provide candid feedback on one's work or weekly statements of encouragement or assignment reminders. Having the ability to contact someone beyond the teacher reduces attrition rates while raising student satisfaction.

**TABLE 23.6**

Online Reading and Writing Techniques (Bonk, 1998; Bonk & Reynolds, 1997; Oliver, Omari, & Herrington, 1999; Paulsen, 1995)

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1. Starter-Wrapper (Hara, Bonk, & Angeli, 2000)
    - a. Starter-Wrapper Conventional: Starter reads ahead and starts discussion and wrapper (and perhaps the teacher) summarizes what was discussed; others participate.
    - b. Starter-Wrapper with Roles: Same as #1 but include roles for other participants (optimist, pessimist, devil's advocate, coach, questioner, mediator, connector, commentator, bloodletter, etc.).
    - c. International Starter-Wrapper: Such discussion occurs with students from other countries and classrooms. Each site alternates starting and wrapping the weekly discussion. Perhaps pair students at remote sites for starter and wrapper roles.
  2. Article Discussions
    - a. Reading Reactions with No Choice: Students post critiques of or reactions to a small set of preassigned articles and react to posts of a certain number of peers.
    - b. Reading Reactions with Extensive Choice: List all the articles in their reading packet within an online discussion tool. Next, assign students to reply to a set number of those articles. They decide which articles they want to discuss and reply to, however.
    - c. Students Article Free Choice: Have students select a set number of articles to read for the semester and have them post summaries of some of them to Web as well as respond to the summaries of their peers.
    - d. Assigned Reading Reactions in Teams: Assign students to read and react to a particular set of articles that they are responsible for, and, near the end of that discussion, summarize and comment on the discussions of another group.
  3. Jigsaw
    - a. Research Article Jigsaw: Assign to groups and then segment article or set of articles within groups (e.g., member #1 reads introduction and literature review; #2 reads the methods section, #3 reads the findings, #4 reads the conclusions and implications, etc.). In each group, students summarize the research flaws and confounds in an electronic discussion and share what was learned.
    - b. Book Jigsaw: Divide up into groups and then divide chapters within groups (e.g., member #1 reads chapters 1 & 2; #2 reads 3 & 4, etc.). Students discuss ideas and findings in an electronic conference and share what learned. Perhaps summarize and present the book ideas to other groups.
  4. Web Explorations and Readings
    - a. Evaluate Existing Articles: Students search for electronic articles on a topic and summarize, categorize, and/or react to them.
    - b. Generate Reading Packet: Students find a set of similar articles on a topic and create an electronic reading packet.
  5. Field Observations Reactions
    - a. Individual Observations: Students observe situations in their field or discipline during internship or job experiences and reflect on how these experiences relate to current course material. Instructors post issues or questions for student reaction.
    - b. Private Online Diaries: Students reflect on field or internship observations in a private online journal (with or without instructor feedback).
    - c. Team Observations: Teams reflect on different aspects of field or internship experiences and summarize them for other teams.
  6. Structured Controversy
    - a. Assigned Roles: Assign two students a pro side and two students a con side and debate an issue electronically and then switch roles and come to compromise; perhaps later post a reflection on the compromise positions of 1–2 other groups.
    - b. Chosen Roles: Same as in "a" above, but students select their own roles.
  7. Topical Discussions
    - a. List possible topics for discussion and have students vote on them and sign up to take the lead on one or more weeks.
    - b. Have students brainstorm list of possible conferencing topics and then take responsibility to lead a week of discussion.
  8. Cases
    - a. Instructor-Generated Cases: Place set number of cases on the Web and link to a bulletin board system or conferencing tool for students to discuss. These cases can be used as collaborative quizzes that instructors and students from other universities or institutions can use.
    - b. Student-Generated Cases: Have students generate a set number of cases during semester based on field experiences or job-related experiences and respond to a set number of peer cases.
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(Continued)

TABLE 23.6 (Continued)

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c.	Exam Preparation Cases: Post a set number of cases for each small group to discuss and answer (these might be on their exam) and all groups must respond to the solutions of one other group.
d.	Team Cases: Post case situations and have students respond in small groups.
9.	Debates
a.	Reading Reactions as Debates with Free Choice: Assign a set number of articles to read, but student reactions on one or more of these must be in the form of a debate.
b.	Reading Reactions in Teams: Assign students to read a particular article or set of articles and also assign pro and con sides of a debate on such reading(s).
10.	Minute Or Muddiest Point Papers
a.	Individual Minute Papers: Have students send the instructor 1–2 minute reflections via e-mail perhaps to recap a class or to summarize things that remain unclear.
b.	Team Minute Papers: Have students share their minute papers in a group and summarize their key points for the instructor and/or for other groups.

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Naturally, there are other ways to engage and involve students in one’s online class. Students might get involved in an online scavenger hunt intended to familiarize them with the resources and tools available on the Web or with a certain content area. Some tools enable students to vote on issues or post their work to the Web. Chat tools foster synchronous guest experts or speakers. The structure of such interactions and overall outcomes varies widely. Guests might simply come in to comment on the quality students postings. At the same time, students might chat with peers in their class who form panels of experts. They also might brainstorm in small groups. Other tools allow students to comment on or rate the work of their peers. If students know that there is an authentic audience beyond the teacher who might read, review, and question their work, then they might get more selective and reflective on their work. Having a gallery of student work is not only motivational for current students, but also it can become a model or standard for future students and instructors.

Online discussion is a vital part of e-learning courses. Instructors can assume many roles here. Typically a conversational or informal role allows for more student participation and dialogue. Formal or directive statements indicate an authoritative model of instruction. Weedman (1999) showed that online environments can foster informal and exploratory conversation that allows students and instructors to take risks and share knowledge. Similarly, in a study of 80 college undergraduates, Ahern, Peck, and Laycock (1992) found that a conversational style of interaction from the instructor produced higher and more complex levels of student participation. When online instructors were more informal and spontaneous in their commenting, students became more interactive with each other, compared to conditions wherein the instructor simply posed formal topic-centered statements or questions. In effect, responding to teacher questions or statements online is simply an extension of the recitation method; the more teacher-centered the environment, the less student exploration, engagement, and interaction. As Tharp and Gallimore (1988) demonstrated with their highly acclaimed “instructional conversation” method, students need to be invited into the discourse through complex interactions of instructor and peer assistance.

### GOALS OF ONLINE LEARNING FRAMEWORKS

Hopefully, the five frameworks presented in this chapter can be integrated to offer practical outcomes and enhanced e-learning opportunities for students. As noted earlier in Table 23.1, the five instructional frameworks for the Web lead to e-learning initiatives related to: (1) research agendas; (2) tool development initiatives; (3) instructional design benchmarks;

**TABLE 23.7**

Other Online Learning Pedagogical Ideas (Bonk, 1998; Bonk & Reynolds, 1997; Herrington & Oliver, 1999; Paulsen, 1995)

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1. Ice Breakers and Closing Activities (Thiagarajan, 1998)
    - a. Eight Nouns Activity: Have students introduce themselves using eight nouns and then explain why they chose each noun.
    - b. Coffee House Expectations: Have everyone post 2–3 of their expectations for the course in the online coffeehouse.
    - c. Treasure Hunts: Have everyone list interests, where born, hobbies, favorite places to visit, job, major, etc., and then have them find one thing in common and one thing different about each member of the class.
    - d. Brainteasers: Post a crossword puzzle, scrambled saying, competition, riddle, dilemma, or “IQ test” and see who can solve it.
    - e. Psychic Massage and Positive Strokes: At the end of the semester or unit, have students nominate a student for whom they must all compliment for his or her contributions to the online class (“the best thing I like about (name) is”).
  2. Scavenger Hunt
    - a. Instructor Generated: Send students on an online scavenger hunt. Such a technique is a useful way to acclimate them to using Web technologies or to a particular content area.
    - b. Student Generated: Have students generate a scavenger hunt for the class as an optional or a bonus assignment.
  3. Voting and Polling
    - a. Minority Views: Have students vote on issues before class and then pull out the minority views at the start of class before the majority opinion dominates (tools like SiteScape Forum and eGroups have a polling and/or voting tool).
    - b. Class Decisions: Use voting and polling tools to make important or interesting class decisions. This provides students with a voice or choice within the class.
  4. Interactive Peer and Guest Commenting
    - a. Link Ratings: Have students not just suggest Web links for the class but also require them to rate or rank those suggested by their peers.
    - b. Profile Commenting: Have students comment on what they have in common with their peers directly in any peer profiles and perhaps rate degree of commonality.
  5. Peer Feedback Roles
    - a. E-mail Pal or Web Buddies: Assign everyone a partner to comment on his or her work (privately or publicly) and generally help each other out during the semester such as with providing peer feedback on self-tests and assignments.
    - b. Critical or Constructive Friends: Assign students a critical or constructive friend who analyzes and critiques one’s work as well as points out positive aspects of it while providing additional support where deemed necessary.
  6. Round-robin Activities
    - a. Storytelling: Have students create a story or scenario by having one person in the group start the story and send to the next group member who adds to it and forwards it on and so forth. The story circulates to everyone in the group. When done, students share their stories with either their entire group or the class.
    - b. Problem Solving: Have students start answering a question or topic and forward their partial answers to someone in their group who adds comments or ideas to it and passes it on till it circulates to everyone in the group. The goal here is to solve the problem originally posed. When done, students share their solutions, case analyses, etc., with either the entire group or class.
  7. Gallery Tours and Publishing of Student Work
    - a. Individual Work: Post student work to the Web as a classroom legacy or archival record to display course expectations to future students.
    - b. Work with Feedback: Post student individual or group projects to the Web and have expert panel, practitioners, or community members evaluate them.
  8. Symposia
    - a. Inside Experts: Have an online panel(s) or symposium(s) of student experts at the end of the semester after students have gone deep into a topic.
    - b. Outside Experts: Have students vote on a set of outside experts they would like to invite for a panel discussion or online symposia and then invite these individuals. Hold symposia and then debrief.
  9. Brainstorming
    - a. Brainstorming without Evaluation: Have students brainstorm ideas on the Web and then post these to the Web. Perhaps create a top ten list.
    - b. Nominal Group Process: Have students brainstorm ideas on the Web and then rank and rate the ideas generated. Calculate average ratings and distribute or create a top ten list.
  10. Guest Experts
    - a. Real-Time Chat: Bring in a guest expert to discuss issues in a real-time chat with preset questions or spontaneous discussion.
    - b. Asynchronous Discussion: Bring in an outside expert for a week or month to discuss some topic of significance to the class in an asynchronous online discussion.
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(4) instructor training programs; and (5) pedagogical guidelines and materials. The ultimate goal is to enhance and transform research, tool design and development, and teaching practices related to online teaching and learning.

### Research Agendas

First of all, given the quality problems with existing e-learning research (Wisher et al., 1999), a focus on future e-learning research is important. For instance, after reviewing the e-learning literature, Bonk and Wisner (2000) detail ten key experiments to address the gaps in the research as well as a set of 17 secondary experiments (for a free download of this paper, see [http://php.indiana.edu/~cjbbonk/Dist.Learn%20\(Wisher\).pdf](http://php.indiana.edu/~cjbbonk/Dist.Learn%20(Wisher).pdf)). Many of these experiments relate to both higher education and military settings. Of course, those researching the questions posed in this and other reports need a forum in which to share their findings.

### Tool Development Initiatives

Second, these frameworks can help tool designers grasp aspects of their tools that are noticeably absent or not working effectively, thereby seeding future generations of online Web-based teaching tools. In Bonk and Dennen (1999), for instance, we designed creative thinking, critical thinking, and cooperative learning activity templates intended to spur courseware development efforts. Instead of summarizing existing tools, we noted the types of online learning tool templates that could be developed in the near future for critical and creative thinking as well as cooperative learning. Such tool templates were designed to foster or jump-start the development of pedagogical tools for the Web, thereby extending the instructional options for teachers and students online. In Bonk, Hara et al., (2000), we similarly noted features of more effective case-based learning tools (e.g., case commentary features, options for shrinking or expanding case views, opportunities to hyperlink different cases, etc.) as well as ideas for creating online communities and textbook support tools.

### Instructional Design Benchmarks

Third, as the Institute for Higher Education Policy (2000) report noted, work in e-learning can lead to benchmarks and advice for designing instruction. Better instructional design and standards of success will increase acceptance for e-learning both within higher education as well as the surrounding community. Not surprisingly, Bonk's (2001) survey indicates that most college faculty need more instructional design support in their e-learning course development efforts.

### Instructor Training Programs

Fourth, having online learning frameworks can help administrators reflect on the training programs needed for more effective and extensive faculty use of these tools in their teaching. There is a preponderance of internal and external support for faculty online teaching efforts. In terms of outside support, there are several recent online training programs and Web sites (e.g., FacultyTraining.net, WebBasedTrainers.com, the Learning Resources Network, TelesTraining.com, and CourseShare.com). There are also new courses and certificate programs for those desiring online teaching and management credentials (e.g., JonesKnowledge.com, Walden Institute, the University of Wisconsin [see <http://www.wisc.edu/depd/index.html>], and the Center for Research on Learning and Technology at Indiana University). Some aggregators of college teaching resources and information (e.g., MERLOT.org, HungryMinds.com, UniversalClass.com,

and CourseShare.com) also provide valuable information for instructors and students. Additionally, online university consortia and communities are portals to resources meant to enhance college teaching and learning.

In addition to external resources, there are a myriad of internal instructor training resources and supports. For instance, campuses such as Indiana University fund media centers and instructional support services, centers for teaching and learning, instructional consulting offices, distributed or distance learning offices, and online access to best practices. More specifically, some faculty training programs offer on-site technical support, mentoring programs, brown bag lunch talks, instructional development grants and stipends, awards and recognitions, summer institutes, online discussions, and so on. Such training programs are extremely varied.

### Pedagogical Guidelines, Reports, Resources, and Materials

Finally, in addition to instructor training programs, Web instruction frameworks should encourage online teaching guidelines as well as useful instructional reports, resources, and materials. Most large universities have reports, newsletters, and other publications to understand the e-learning trend (e.g., Cronin & Duffy, 1997). In addition, a myriad of books and special journal issues are beginning to offer e-learning clarity and guidance for those making key technological or instructional decisions.

Bonk, Wisher, and Lee (in review), for instance, document 10 key benefits and associated implications of e-learning. For example, since students are excited to publish work online, the instructor, with proper permissions, might create a classroom legacy and archive of best class products. These authors also document 10 key problems and solutions related to online learning that can help new as well as experienced instructors avoid common pitfalls of the online teaching experience. Consequently, they recommend providing explicit expectations and guidelines related to when and how much to post as well as samples of prior student work and other forms of structuring online tasks. Despite many e-learning inroads, there remains a need for additional guidelines related to instructor course development, course facilitation, student interaction and participation, feedback and grading practices, and so on.

## LINKING FRAMEWORKS TO LEARNING COMMUNITIES

Hopefully the above frameworks and overall structure for frameworks will assist administrators creating e-learning policies, instructors attempting to foster online collaboration and interaction, and policymakers funding e-learning research, design, and training initiatives. Of course, it is important to not only better understand e-learning psychological principles, interaction patterns, tools, roles, and strategies, but also there is a pressing need to link these frameworks into an investigation of how online communities are formed and sustained. Such an ultimate framework must address issues related to psychological safety or tone, shared online histories or knowledge, instructional flexibility, student autonomy and individualization, project collaboration and product development, idea sharing, social support, respect and empathy, online rituals, and team building, camaraderie, and identity development (Barab & Duffy, 2000; Schwier, 1999). Many open issues exist here today.

## FINAL THOUGHTS

As higher education instruction is stretched into new electronic environments, e-learning frameworks will play a vital role in helping instructors, administrators, and policymakers reflect on their decisions concerning the theoretical perspectives, tools, activities, interaction patterns,

roles, and instructional strategies pertinent to online learning. Frameworks can also lead to more focused research agendas, enhanced tool and courseware designs, prominent course and program comparison benchmarks, well-planned instructor training programs, accessible pedagogical materials and reports, and better overall online teaching and learning environments. As courses and programs for online learning mount, there will be additional (and perhaps better) frameworks, perspectives, and models that can assist in improving Web-based teaching and learning. Let's make it so.

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## REFERENCES

- Ahern, T. C., Peck, K., & Laycock, M. (1992). The effects of teacher discourse in computer-mediated discussion. *Journal of Educational Computing Research*, 8(3), 291–309.
- Alexander, P. A., & Murphy, P. K. (1994). *The research base for APA's learner-centered psychological principles*. Paper presented at the American Educational Research Association annual meeting, New Orleans, LA.
- American Psychological Association. (1993). *Learner-centered psychological principles: Guidelines for school reform and restructuring*. Washington, DC: American Psychological Association and the Mid-continent Regional Educational Laboratory.
- American Psychological Association. (1997). *Learner-centered psychological principles: A framework for school redesign and reform*. Washington, DC: American Psychological Association, <http://apa.org/ed/lcp/html>.
- Ashton, S., Roberts, T., & Teles, L. (1999). *Investigation the role of the instructor in collaborative online environments*. Poster session presented at the CSCL '99 Conference, Stanford University, CA.
- Barab, S. A., & Duffy, T. (2000). From practice fields to communities of practice. In D. Jonassen & S. M. Land (Eds.), *Theoretical foundations of learning environments* (pp. 25–56). Mahwah, NJ: Lawrence Erlbaum Associates.
- Berge, Z. L. (1995). Facilitating computer conferencing: Recommendations from the field. *Educational Technology*, 35(1), 22–30.
- 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. (See [http://php.indiana.edu/~cjbonk/paper/smart\\_paper.html](http://php.indiana.edu/~cjbonk/paper/smart_paper.html).)
- Bonk, C. J. (2001). *Online teaching in an online world*. Bloomington, IN: CourseShare.com. [see <http://PublicationShare.com>].
- Bonk, C. J., & Cummings, J. A. (1998). A dozen recommendations for placing the student at the centre 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., Daytner, K., Daytner, G., Dennen, V., & Malikowski, S. (2001). Using Web-based cases to enhance, extend, and transform preservice teacher training: Two years in review. *Computers in the Schools*, 18(1), 189–211. NY: Haworth Press.
- 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., Fischler, R. B., & Graham, C. R. (2000). Getting smarter on the Smartweb. In D. G. Brown (Ed.), *Teaching with technology: Seventy-five professors from eight universities tell their stories* (pp. 200–205). Boston, MA: Anker Publishing.
- Bonk, C. J., Hara, H., Dennen, V., Malikowski, S., & Supplee, L. (2000). We're in TITLE to dream: Envisioning a

- community of practice, "The Intraplanetary Teacher Learning Exchange." *CyberPsychology and Behavior*, 3(1), 25–39.
- Bonk, C. J., & King, K. S. (Eds.). (1998). *Electronic collaborators: Learner-centered technologies for literacy, apprenticeship, and discourse*. Mahwah, NJ: Lawrence 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., Malinkowski, S., Angeli, C., & East, J. (1998). Case-based conferencing for preservice teacher education: Electronic discourse from the field. *Journal of Educational Computing Research*, 19(3), 269–306.
- Bonk, C. J., Malinkowski, S., Angeli, C., & Supplee, L. (1998, April). *Holy COW: Scaffolding case-based "Conferencing on the Web" with preservice teachers*. Paper presented at the American Educational Research Association (AERA) annual convention, San Diego, CA.
- Bonk, C. J., Medury, P. V., & Reynolds, T. H. (1994). Cooperative hypermedia: The marriage of collaborative writing and mediated environments. *Computers in the Schools*, 10(1/2), 79–124.
- 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: Educational Technology Publications.
- Bonk, C. J., & Sugar, W. A. (1998). Student role play in the World Forum: Analyses of an Arctic learning apprenticeship. *Interactive Learning Environments*, 6(1–2), 1–29.
- Bonk, C. J., & Wisner, R. A. (2000). *Applying collaborative and e-learning tools to military distance learning: A research framework* (Technical Report #1107). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (Note: This report has unlimited distribution. See: [http://php.indiana.edu/~cjbbonk/Dist.Learn%20\(Wisher\).pdf](http://php.indiana.edu/~cjbbonk/Dist.Learn%20(Wisher).pdf).)
- Bonk, C. J., Wisner, R. A., & Lee, J. (in review). Moderating learner-centered e-learning: Problems and solutions, benefits and implications.
- Cronin, B., & Duffy, T. M. (1997). *Distributed education and Indiana University: Context, trends, and assumptions*. Bloomington: Indiana University.
- Cummings, J. A., Bonk, C. J., & Jacobs, F. R. (2002). Twenty-first century college syllabi: Options for online communication and interactivity. *Internet and Higher Education*, 5(1), 1–19.
- Dennen, V. (2000). Task structuring for on-line problem based learning: A case study. *Educational Technology and Society*, 3(3), 329–336.
- Dennen, V., & Bonk, C. J. (in review). *Cases, conferencing, and communities of practice: A qualitative study of online mentoring for preservice teachers*.
- Gray, S. (1998). Web-based instructional tools. *Syllabus*, 12(2), see [http://www.syllabus.com/syllabusmagazine/sep98\\_magfea2.html](http://www.syllabus.com/syllabusmagazine/sep98_magfea2.html).
- Gray, S. (1999). Collaboration tools. *Syllabus*, 12(5), 48–52.
- Hara, N., Bonk, C. J., & Angeli, C., (2000). Content analyses of on-line discussion in an applied educational psychology course. *Instructional Science*, 28(2), 115–152.
- Herrington, J., & Oliver, R. (1999). Using situated learning and multimedia to investigate higher-order thinking. *Journal of Educational Multimedia and Hypermedia*, 8(4), 401–421.
- Innovations in Distance Education. (2000). *An emerging set of guiding principles and practices for the design and development of distance education*. Pennsylvania State University, [www.outreach.psu.edu/de/ide/](http://www.outreach.psu.edu/de/ide/).
- Institute for Higher Education Policy. (2000). *Quality on the line: Benchmarks for success in Internet-based distance education*. Washington, DC: The Institute for Higher Education Policy.
- Kirkley, S. E., Savery, J. R., & Grabner-Hagen, M. M. (1998). Electronic teaching: Extending classroom dialogue and assistance through email communication. In C. J. Bonk, & K. S. King (Eds.), *Electronic collaborators: Learner-centered technologies for literacy, apprenticeship, and discourse* (pp. 209–232). Mahwah, NJ: Erlbaum.
- Koschmann, T. D. (Ed.). (1996). *CSCL: Theory and practice of an emerging paradigm*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Looms, T. (2000, November 17). *Survey of course and test delivery/management systems for distance learning*. <http://www.seas.gwu.edu/%7Eetlooms/assess.html>.
- Mason, R. (1991). Moderating educational computer conferencing. *DEOSNEWS*, 1(19), 1–11.
- Mason, R. (1998). Models of online courses. *Asynchronous Learning Networks Magazine*, 2(2), 1–11.
- Massey, C., & Curry, J. (1999). *Online post-secondary education: A competitive analysis*. Burnaby, BC, Canada: TeleLearning Network Centers of Excellence (NCE).
- National Center for Education Statistics (NCES), (1999). (Lewis, L., Snow, K., Farris, E., Levin, D., & Greene, B.). (1999). *Distance education at postsecondary education institutions: 1997–98* (National Center for Education Statistics, NCES 2000-013). Washington, DC: U.S. Department of Education.
- National Educational Association. (2000, June). *A survey of traditional and distance learning higher education members*. Washington, DC: The National Education Association.

- Oliver, R., & Herrington, J. (2000). Using situated learning as a design strategy for Web-based learning. In B. Abbey (Ed.), *Instructional and cognitive impacts of Web-based education* (pp. 178–191). Hershey, PA: Idea Group Publishing.
- Oliver, R., & McLoughlin, C. (1999). Curriculum and learning-resources issues arising from the use of web-based course support systems. *International Journal of Educational Telecommunications*, 5(4), 419–436.
- Oliver, R., Omari, A., & Herrington, J. (1998). Exploring student interactions in collaborative World Wide Web computer-based learning environments. *Journal of Educational Multimedia and Hypermedia*, 7(2/3), 263–287.
- Paulsen, M. F. (1995). Moderating educational computer conferences. In Z. Berge & M. P. Collins (Eds.), *Computer-mediated communication and the on-line classroom in distance education*. Cresskill, NJ: Hampton Press.
- Phipps, R., & Merisotis, J. (1999). *What's the difference?: A review of contemporary research on the effectiveness of distance learning in higher education*. Washington, DC: The Institute for Higher Education Policy.
- Rowley, D. J., Lujan, H. D., & Dolence, M. G. (1998). *Strategic choices for the academy: How demand for lifelong learning will re-create higher education*. San Francisco: Jossey Bass.
- Russell, T. L. (1999). *The "no significant difference phenomenon."* Chapel Hill, NC: Office of Instructional Telecommunications, North Carolina University. <http://cuda.teleeducation.nb.ca/nosignificantdifference/>.
- Schwier, R. A. (1999). *Turning learning environments into learning communities: Expanding the notion of interaction in multimedia*. In B. Collis & R. Oliver (Eds.), *Proceedings of Ed-Media 99: World Conference on Educational Multimedia, Hypermedia and Telecommunications*, Seattle, Washington, Norfolk, VA: Association for the Advancement of Computers in Education, 282–286.
- Tharp, R., & Gallimore, R. (1988). *Rousing minds to life: Teaching, learning, and schooling in a social context*. Cambridge, MA: Cambridge University Press.
- The Report of the University of Illinois Teaching at an Internet Distance Seminar. (1999). *Teaching at an Internet distance: The pedagogy of online teaching and learning*. University of Illinois Faculty Seminar, Urbana-Champaign, IL: The University of Illinois.
- Thiagarajan, S. (1998, March). What can an icebreaker do? *Thiagi GameLetter: Seriously fun activities for trainers, facilitators, and managers*, 1(1), p. 2, San Francisco, CA: Jossey-Bass/Pfeiffer.
- Wagner, E. D., & McCombs, B. L. (1995). Learner centered psychological principles in practice: Designs for distance education. *Educational Technology*, 35(2), 32–35.
- Weedman, J. (1999). Conversation and community: The potential of electronic conferences for creating intellectual proximity in distributed learning environments. *Journal of the American Society for Information Science*, 50(10), 907–928.
- Wisher, R. A., Champagne, M. V., Pawluk, J. L., Eaton, A., Thornton, D. M., & Curnow, C. K. (1999). *Training through distance learning: An assessment of research findings* (U.S. Army Research Institute for the Behavioral Sciences Technical Report 1095). Alexandria, VA: U.S. Army Research Institute for the Behavioral Sciences.