From **Instruction and technology: Designs for everyday learning**
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The six tables presented here provide a much-abbrieviated summary of research contained in Mehlenbacher (in preparation) "Instruction and technology: Designs for everyday learning."

Following a summary of 12 models of formal instructional situations (Mehlenbacher, 2008), we saw that several features or dimensions of instructional situations received considerable, repeated consideration. Elsewhere we have argued that it is useful to generalize to all (or everyday) instructional *situations* before immediately turning to online learning environments (Mehlenbacher, 2002). The models reviewed emphasized learners, instructors, instructional strategies, content, group interaction, learning outcomes, and institutional context. Our model collapses instructors with instructional strategies, views content as being shared by learners, instructors, and social dynamics, and sets learning outcomes and institutional contexts outside our focus of attention. See **Table 1** for an elaboration of the five dimensions of everyday instructional situations.

In brief, all instructional situations can be described as involving learners (with particular biological, cognitive, affective, socioeconomic attributes), tasks (read this poem, solve this mathematical problem, measure this flame), social dynamics (one-way explanation, discussion, groupwork), instructional activities (expectations, methods, objectives), environments (seminar rooms, classrooms) and artifacts (whiteboards, chairs, pencils) for learning.

Table 2 focuses on learners, generally, organizing them from individual physical and cognitive to social and communal attributes, although factors that comprise each learner attribute (e.g., abilities as cognitive and physical) are sorted alphabetically to avoid privileging particular factors. Thus, although geographical factors may be a more powerful an indicator of learner behavior than family issues, family preceeds geographic alphabetically.

Table 3 is an example of how research-based recommendations for practice in online instruction might be generated from a quick review of the literatures related to instruction and learning with technology. The design principles have been organized around the five dimensions of everyday instructional situations.

Table 4 draws on the considerable research devoted to the usability of performance systems and to Web-based instruction design (Bevan, 1998; Nielsen, 1994, 1997; Mehlenbacher, 2003; Mehlenbacher, Miller, Covington, & Larsen, 2000; Zaharias, 2004). From this considerable research base, we can begin to outline a set of heuristics for the designers and evaluators of online learning environments.

Our framework for everyday instructional situations can ultimately be applied to our working understandings of the literatures on instruction and learning with technology. **Table 5** presents a matrix for organizing future research studies on the relationship between instruction, learning, and technology.

Finally, **Table 6** presents a summary of the articles published in one peer-reviewed journal, the *American Journal of Distance Education*, between 2002 and 2006. The articles are tagged according to the five dimensions of instructional situations: LB for Learner Background and Knowledge, TA for Learner Tasks and Activities, SD for Social Dynamics, IA for Instructor Activities, and EA for Learning Environment and Artifacts.

Table 1: Five dimensions of everyday instructional situations[1]

Dimensions of Instructional Situations	Relevant Activities or Attributes
Learner Background & Knowledge 	• highlighting role of learner characteristics and prior knowledge • applying skills and abilities, learning and technology experiences, standardized test taking, and general educational success to various learning contexts • comprising of the biological attributes (age, gender, race/ethnicity), abilities (cognitive, physical), personal identity (learning style, attitude, motivation, self-monitoring), literacies (computer, domain, textual, visual), and sociocultural context (family, economic, organizational, geographical) of learners in both formal and informal instructional situations
Learner Tasks & Activities 	• focusing on the nature of tasks (e.g., requirements, procedures, importance, frequency, time, complexity), user behaviors and expectations, and human problem-solving activities • involving actions with learning materials, exercises, goals, processes (e.g., reading to learn, reading to learn to do, reading to analyze, reading to compare, confirm, correct) • emphasizing individual or distributed learner activities related to discovering, sampling, comparing, referring, organizing, illustrating, and generalizing
Social Dynamics 	• drawing on computer-mediated communication, collaboration and groupwork, social cognition, and communities of interest • comprising of socioemotional-affective-cognitive interactions between learners and instructors, learners and learners, learners and content, learners and interfaces, instructors and content, instructors and interfaces, instructors and other instructors, content and content, and institutional support structures • requiring responsiveness, social relationships and abilities, personal styles, strategies for scheduling, group management, immediacy, and self-assessment
Instructor Activities 	• stressing authentic problem-based goals for instruction in projects and learning activities • adapting to audience, communication of content, objectives, prior knowledge, information exchange, topic elaboration, topic pacing and flow, sequencing, methods of evaluation, and immediacy of feedback • understanding of subject matter, theories of knowledge, pedagogy, and learning transfer
Learning Environment & Artifacts 	• moving from drill-and-practice to computer-assisted learning to Web-based artifacts that facilitate learners, their tasks, and the purpose and goals of the instruction • selecting instructional artifacts (e.g., reading and writing applications that support viewing, managing, and disseminating individual and shared documents) promoting mentoring and open exchange of ideas, discussion, pacing and flow, meaningful sequencing, methods of evaluation, and immediacy of feedback • optimizing ergonomic design for usability, comfortable and functional versus merely aesthetic, promoting discussion face-to-face, virtually, and design for both worlds, supporting one-to-one, one-to-many, and many-to-many communication and exchange

[1] Earlier versions of this table appear in Mehlenbacher (1998), as the five dimensions of an instructional situation characterizing Web-based and conventional classes (Mehlenbacher, et al., 2000, p. 179), and in Mehlenbacher (2002), Mehlenbacher, et al. (2005), and Mehlenbacher (2007).

Table 2: Characterizing learners, their background and knowledge

Learner Attributes	**Factors for Each Learner Attribute**
Biological Attributes	*Age*: children, adults, seniors *Gender*: male, female, masculine, feminine *Race/ethnicity*: Caucasian, African-American, Asian, etc.
Abilities	*Cognitive*: learning capacity, intelligence scores, prior knowledge, testing ability, educational level, metacognitive abilities *Physical*: ambulatory, haptic, visual, auditory
Personal Identity	*Attitude/motivation*: orientation towards task, engagement, affective expectations, intention (Davies, 2006), self definition, esteem levels, self-sufficiency (Meyer, 2002) *Learning style*: reflective, sequential, deductive, inductive, flexibility (James & Gardner, 1995) *Self-monitoring*: strategies for assessing own learning progress, internal sphere of control (Hiltz & Shea, 2005)
Literacies	*Computer*: training or education with technology, platform- and application-specific familiarity, adaptability, problem solving, task experience, novice or expert, prior online experience *Domain*: knowledge of application area, education, testing capability, time management skills, academic accreditation, general knowledge of scientific, economic, multicultural, and global principles governing expertise (Burkhardt, et al., 2003) *Textual*: reading level, verbal ability, ESL/International, basic numeracy *Visual*: experience with scientific and data visualization, various media information types, spatial systems, simulation, virtual reality environments
Sociocultural Context	*Family*: parents' education, expectations, primary language, educational involvement *Economic*: high, low income, support and living expenses *Geographic*: rural, urban, low or concentrated populations, developed, developing countries *Organizational*: large or small, private, public, educational or production

Table 3: Recommendations for everyday instruction across five dimensions

Support Strategies	References
Learner Background and Knowledge	
• Allows novices to get familiar with complex notions without excessive cognitive load • Supports building of theories, beliefs, conceptual manipulation • Leads to deeper understanding (ie., understanding surpasses what could be achieved without support) • Empowers learners to extend thinking and process higher-order concepts • Supports learning of self-regulation and development of meta-knowledge • Refines understanding through experience • Supports development of learner's "need to know more" information	Hannafin & Land (1997, pp. 182-184)
• Enables and encourages learners to explore different perspectives • Provides opportunities for reflection • Allows opportunities for articulation	Herrington, Oliver, & Herrington (2007, pp. 27-28)
• Integrates theoretical knowledge with participants' practical experience • Structures support and guidance for learning in all phases of the learning process • Supports conscious reasoning and self-assessment, setting one's own (ie., not set by the environment) learning goals (What do I know; What should I learn?)	Tynjälä & Häkkinen (2005, pp. 330-331)
Learner Tasks and Activities	
• Uses clear expectations and prompt task structuring • Embeds thinking skills and portfolio assessment as integral part of assignments • Explores recursive assignments that build from personal knowledge • Provides clear expectations and prompt task structuring • Varies forms of writing, reflection, and other pedagogical activities	Bonk & Dennen (2003, p. 335)
• Allows retrieval of information from online information archives … and commercial databases • Supports individual and group presentations • Enables practice and experience using emerging technologies that may be intrinsically useful in today's society	Collins & Berge (1995, pp. 3-4)
• Provides ill-defined activities that have real-world relevance • Presents complex tasks to be completed over extended periods of time	Herrington, et al. (2007, p. 27)
• Serves as a resource for the identification, evaluation, and integration of a variety of information • Acts as a medium of collaboration, conversation, discussions, exchange, and communication of ideas • Behaves as an international platform for the expression and contribution of artistic and cognitive understandings and meanings • Works as a medium for participating in simulated experiences, apprenticeships, and cognitive partnerships	Relan & Gillani (1997, p. 43)
Social Dynamics	

• Included public conferencing, such as discussion lists using mainframe Listserv software • Allows interactive chat, used to brainstorm with teachers or peers and to maintain social relationships • Involves personal networking and professional growth and such activities as finding persons with similar interests on scholarly discussion lists • Supports peer review of writing, or projects involving peer learning, groups/peer tutorial sessions, and peer counseling	Collins & Berge (1995, pp. 3-4)
• Encourages collaboration and exchange between different groups of people (professional groups, people from different domains, experts and novices, for example) • Facilitates real dialogue • Enables construction of new knowledge on the basis of others' contributions, sharing cognitive load • Externalizes group processes and increasing awareness of them • Involves tasks that force groups to collaborate and coordinate knowledge • Supports shared workspaces	Tynjälä & Häkkinen (2005, pp. 330-331)
 Instructor Activities	
• Facilitates, does not dictate • Allows choice • Looks for ways to enhance the learning experience • Varies forms of mentoring and apprenticeship • Uses public and private forms of feedback • Uses student explorations to enhance course content	Bonk & Dennen (2003, p. 335)
• Mentors, advising and guiding students • Involves project-based instruction, either within the classroom or in projects involving community, national, or international problem-solving • Includes guest lecturing, promoting interaction between students and persons in the larger community • Provides didactic teaching, that is, supplying course content, posting assignments, or other information germane to course work • Supports course management, for example, advising, delivery of course content, evaluation, collecting and returning assignments • facilitates collaboration • Includes computer-based instruction, such as tutorials, simulations, and drills	Collins & Berge (1995, pp. 3-4)
• Allows learners to "make sense" out of what they know, engages them in complex ideas • Supports meta-knowledge about problem solving; addresses complex thinking versus rote memory and disassociation problem • Leads to deeper understandings and personal model building and refinement • Increases meaningful understandings and relationships with phenomena	Hannafin & Land (1997, p. 182)
• Provides access to expert performances and models • Includes apprenticeship and scaffolding approaches to learning • Allows coaching of both instructor to learner and also learner to learner	Herrington, et al. (2007, p. 27)

 Learning Environment and Artifacts	
• Diminishes over-simplification problem; supports flexible, decontextualized knowledge that can be applied outside of a particular context • Supports more complex and multi-faceted understanding • Addresses complex learning goals issue • De-emphasizes misconceptions and passivity due to disassociated learning • Orients learners to interrelatedness of knowledge; learners use knowledge as a "tool" • Presents abstract notions to be experienced, manipulated, scrutinized • Provides deeper understanding through "getting to know" phenomena; formulate and develop personal understanding and decisions	Hannafin & Land (1997, pp. 185-186)
• Includes computer mediation (for indexing, storing, searching, disseminating information) • Supports geographic independence ("learning is no longer restricted to the physical buildings of the learning institution, and consequently the problems of overcrowding start to disappear," p. 20) • Enables temporal independence (teachers and learners do not need to synchronize their meeting times and instructors have the ability to control their schedules; "Students no longer must compete with other students for the educator's limited time," p. 21) • Includes platform independence ("nature of the Web almost totally removes this problem" of relying on any particular hardware or software type, p. 21) • Provides a simple, familiar interface • Increases communication ("it is commonly reported that people will talk more electronically (via e-mail or a chat program) than they do in a face-to-face situation," p. 21) • Increases learner control (student feelings of control over their own educational experience and the way that they are asked to learn particular materials (pp. 20-22)	McCormack & Jones (1998, pp. 20-22)
• Hyperlinks textual material, incorporating pictures, graphics, and animation • Supports videotaped elaboration of subject matter, including interviews, and panel discussions • Hyperlinks multimedia elements such as QTVs, simulations, graphics, and animations • Supports just-in-time access to a range of electronic databases, search engines, and online libraries • Allows just-in-time access to coaching and assistance via telementors, e-communities, and peers	Naidu (2003, p. 353)
• Integrates different forms of representation and different forms of learning activities (reading, writing, discussing, using metaphors, audio, visual, etc.) • Integrates e-learning with face-to-face learning situations whenever possible • Emphasizes the links between authentic work activities and e-learning material and virtual discussion	Tynjälä & Häkkinen (2005, pp. 330-331)

Table 4: Task-oriented usability heuristics for WBI design and evaluation

Usability Heuristics for WBI Design and Evaluation	
Learner Background and Knowledge	
Accessibility	Has the WBI been viewed on different platforms, browsers, and modem speeds? Is the site ADA compliant (e.g., red and yellow colors are problematic for visually-challenged users)? Have ISO-9000 standards been considered?
Customizability & maintainability	Does printing of the screen(s) require special configuration to optimize presentation and, if so, is this indicated on the site? Are individual preferences/sections clearly distinguishable from one another? Is manipulation of the presentation possible and easy to achieve?
Error support & feedback	Is a design solution possible that prevents a problem from occurring in the first place? When users select something does it differentiate itself from other unselected items? Do menu instructions, prompts, and error messages appear in the same place on each screen? Is feedback of the appropriate type (textual, graphical, auditory) for the information being displayed? Do error messages plainly describe what action or assistance is available?
Navigability & user movement	Does the site clearly separate navigation from content? How many levels down can users traverse and, if more than three, is it clear that returning to their initial state is possible with a single selection? Can users see where they are in the overall site at all times? Do the locations of navigational elements and general layout of text and graphics remain consistent? Is the need to scroll minimized across screens and frames within screens?
User control, error tolerance, & flexibility	Are learners allowed to undo or redo previous actions? Can users cancel an operation in progress without receiving an error message? Are multiple windows employed that can be manipulated easily? Do the instructional materials support the learner's workflow, allowing shortcuts if desired? Can learners annotate the instructional content themselves?
Learner Tasks and Activities (Interaction Display)	
Aesthetic appeal	Does the screen design appear logical and minimalist (uncluttered, readable, memorable)? Are graphics or colors employed aesthetically and functionally, accompanied and identified in text, meaningfully labeled, and reducing unnecessary information where possible? Are distractions minimized (e.g., movement, blinking, scrolling, animation, etc.)? Is the information design pleasant, engaging, attractive, fun, stimulating, or emotionally satisfying?
Consistency & layout	Does every screen display begin with a title/subject heading that describes contents? Is there a consistent icon design and graphic display across screens? Do words and terms describe the same items throughout the site? Is layout, font choice, terminology use, color, and positioning of items the same throughout the site (< 4 of any of the above is usually recommended)?

Usability Heuristics for WBI Design and Evaluation	
Typographic cues & structuring	Does text employ meaningful discourse cues, modularization, chunking? Is information structured by meaningful labeling, bulleted lists, or iconic markers? Are legible fonts and colors employed? Is the principle of left-to-right placement linked to most-important to least-important information?
Visibility of features & self-description	Are objects, actions, and options visible? Do users have to remember information from one part of a dialogue to another? Are prompts, cues, and messages placed where users will be looking on the screen? Do text areas have "breathing space" (ie., white space) around them? Is white space used to create symmetry and to lead the eye in the appropriate direction?
 **Social Dynamics**	
Communication protocols	Are instructions provided for engaging with other learners online? Are instructions and resources related to collaboration, teamwork, and group processes provided? Have methods and guidelines for copyright, fair use, and the management of group rights been made available? Are documents, resources, and task instructions shared across learners?
Mutual goals & outcomes	Are learners rewarded for communicating? Are communication applications provided that allow synchronous and asynchronous interaction? Do communication applications allow information revision, organization, and management? Are interactions organized around instructional objectives and task deliverables?
Shared resources	Does environment support group presentation, analysis, problem solving, and artifact construction? Can learners control whether information and communication is private at the individual and group level? Are various media able to be exchanged with ease by learners? Can learners manipulate planning and scheduling resources individually and in groups?
 **Instructor Activities**	
Authority & authenticity	Does the site establish a serious tone or presence? Is simple language used and jargon appropriate for the intended audience? Are users reminded of the security and privacy of the site? Are humor or anthropomophic expressions used minimally? Is direction given for further assistance if necessary?
Concurrency	Are feedback and assessment made available for learner viewing? Are site features and materials germane, timely, and designed around learner needs and expectations? Is instructor-learner feedback thought-provoking (e.g., encouraging elaboration, clarification, questioning)?
Intimacy & presence	Is an overall tone established that is present, active, timely, respectful, and engaging? Does the discourse model solidarity, acceptance, warmth, and trustworthiness? Does the site act as a learning environment for users, not simply as a

Usability Heuristics for WBI Design and Evaluation	
	warehouse of unrelated links?
Environment and Artifacts	
Completeness	Are levels clear and explicit about the "end" or parameters of the site (thus avoiding unnecessary learning)? Are there different "levels" of use and, if so, are they clearly distinguishable? Are the beginnings and endings of tasks easy to identify?
Examples & case studies	Are examples, demonstrations, or case studies of user experiences available to facilitate learning? Are examples divided into meaningful sections, e.g., overview, demonstration, explanation, and so on?
Help & support documentation	Does the site support task-oriented help, tutorials, and reference documentation? Is help easy to locate and access on the site? Is the help table of contents or menu organized functionally, according to user tasks?
Metaphors & maps	Does the site use an easily recognizable metaphor that helps users identify applications in relation to each other, their state in the system, and options available to them? Does the site provide a spatial layout and temporal organization that is meaningful for and among learners? Do graphics, videos, animations, and sounds contribute to the purpose and message of the site?
Organization & information relevance	Is a site map available? Is the overall organization of the site clear from the majority of screens? Are primary options emphasized in favor of secondary ones?
Readability & quality of writing	Is the text in active voice and concisely written (> 4 < 15 words/sentence)? Are terms consistently plural, verb+object or noun+verb, avoiding unnecessarily redundant words? Do field labels reside on the right of the fields they are closely related to? Does white space highlight a modular text design that separates information chunks from each other? Are bold and color texts used sparingly to identify important text (limiting use of all capitals and italics to improve readability)? Can users understand the content of the information presented easily?
Relationship with real-world tasks	Is terminology and labelling meaningful, concrete, and familiar to the target audience? Do related and interdependent functions and materials appear on the same screen? Is sequencing used naturally, if sequences of common events or narratives are expected? Does the site allow users to easily complete their transactions or selections?
Reliability & functionality	Are all functions labelled clearly? Do all the menus, icons, links, and opening windows work predictably across platforms? Have important interactive features and multimedia elements been tested across platforms and browsers?

Table 5: Research initiatives organized around the five dimensions of everyday instructional situations

Research Matrix for the Five Dimensions of all Instructional Situations					
	Learner Background & Knowledge	*Learner Tasks & Activities*	*Social Dynamics*	*Instructor Activities*	*Learning Environment & Artifacts*
Learner Background & Knowledge 		• Demographics and scholarly primitives • Learning styles and problem solving	• How different learners interact • Personality attributes and classroom conflict	• Perceptions of instructors • Understanding teaching styles	• Accessibility issues and usability • Designing for engagement
Learner Tasks & Activities 	• Designing tasks for particular learners • Cognitive workload and authenticity		• Interfaces for collaborative work • Discourse moves in discussion lists	• Managing different tasks • Instructor comments and learner revision	• Representing and analyzing texts • Applications for extending creativity
Social Dynamics 	• Interaction between different learners • Linguistic variables and interaction	• Alternative group interaction and different task types • Cross cultural collaboration in class		• Instructor perceptions of asynchronous discussions • Interaction strategies and professional development	• Resources for augmenting learner collaboration • Peer review applications
Instructor Activities 	• Diversity and inclusive instruction • Cognitive engagement online	• Simple versus complex problem use • Textual versus graphical lessons	• Group sizes and management • Managing group conflict		• Managing presence and authority • Building learning objects
Learning Environment & Artifacts 	• Methods for audience analysis • Learner perceptions of multimedia lessons	• Applications for assignment submission and evaluation • Teaching critical thinking	• Software for measuring group productivity • Shared documents and group work	• Usable assignment structures • Program quality in WBI	

Table 6: *American Journal of Distance Education* journal analysis, 2002-2006

***American Journal of Distance Education* Article Analysis (2002-2006)** **Year, Volume, Page Number, Authors, Title, Instructional Dimension**			
2006, 20			
231-244	Hawkes, M.	Linguistic discourse variables as indicators of reflective online interaction	LB SD
211-229	Graddy, D. B.	Gender salience and the use of linguistic qualifiers and intensifiers in online course discussions	LB SD
191-193	Jeong, A.	Gender interaction patterns and gender participation in computer-supported collaborative argumentation	LB SD
163-179	Pomales-Garcia, C., Liu, Y.	Web-based distance leanring technology: The impacts of Web module length and format	TA IA EA
143-161	Moisey, S. D., Ally, M., Spencer, B.	Factors affecting the development and use of learning objects	TA EA
93-107	Mabrito, M.	A study of synchronous versus asychronous collaboration in an online business writing class	TA SD EA
65-77	Young, S.	Student views of effective online teaching in higher education	LB IA
39-50	Schumm, W. R., Webb, F. J., Turek, D. E., Jones, K. D., Ballard, G. E.	A comparison of methods for teaching critical thinking skills for U.S. army officers	TA EA
23-37	Richardson, J. C.	The role of students' cognitive engagement in online learning	LB IA
7-22	Harroff, P. A., Valentine, T.	Dimensions of program quality in Web-based adult education	IA EA
2005, 19			
229-240	Popovich, C. J., Neel, R. E.	Characteristics of distance education programs in accredited business schools	EA
215-227	Hee, J. C., Johnson, S. D	The effect of context-based video instruction on learning and motivation in online classes	LB IA
197-214	Oriogun, P. K., Ravenscroft, A., Cook, J.	Validating an approach to examining cognitive engagement within online groups	LB SD
163-181	Yang, Y-T. C., Newby, T. J., Bill, R. L.	Using Socratic questioning to promote critical thinking skills through asynchronous discussion forums in distance learning environments	LB IA
149-162	Dongsong, Z.	Interactive multimedia-based e-learning: A study of effectiveness	LB EA
133-148	Garrison, D. R., Cleveland-Innes, M.	Facilitating cognitive presense in online learning: Interaction is not enough	LB IA
105-118	Stein, D. S., Wanstreet, C. E., Calvin, J., Overtoom, C., Wheaton, J. E.	Bridging the transactional distance gap in online learning environments	LB SD
87-103	Egan, T. M., Akdere, M.	Clarifying distance education roles and competencies: Exploring similarities and differences between professional and student-practitioner perspectives	LB TA

American Journal of Distance Education **Article Analysis (2002-2006)** **Year, Volume, Page Number, Authors, Title, Instructional Dimension**			
71-85	Adams, J., DeFleur, M. H.	The acceptability of a doctoral degree earned online as a credential for obtaining a faculty position	LB IA
51-64	Roberts, T. G., Irani, T. A., Telg, R. W., Lundy, L. K.	The development of an instrument to evaluate distance education courses using student attitudes	SB IA
37-50	Duphome, P. L., Gunawardena, C. N.	The effect of three computer conferencing designs on critical thinking skills of nursing students	LB TA
23-36	Morris, L. V., Wu, S-S., Finnegan, C. L.	Predicting retention in online general education courses	LB TA
5-22	Fahy, P. J., Ally, M.	Student learning style and asynchronous Computer-Mediated Conferencing (CMC) interaction	LB SD
2004, 18			
225-241	Lee, Y., Driscoll, M. P., Nelson, D. W.	The past, present, and future of research in distance education: Results of a content analysis	EA
207-223	Giguere, P. J., Formica, S. W., Harding, W. M.	Large-scale interaction strategies for Web-based professional development	TA SD
199-206	Dupin-Bryant, P. A.	Pre-entry variables related to retention in online distance education	LB SD
169-185	Belanich, J., Wisher, R. A., Orvis, K. L.	A question-collaboration approach to Web-based learning	TA SD
151-167	Hanlon, L. L.	Accreditation of distance learning in the field of dentistry	LB EA
131-150	Stewart, I., Eunsook, H., Strudler, N.	Development and validation of an instrument for student evaluation of the quality of Web-based instruction	LB EA
103-114	Bender, D. M., Wood, B. J., Vredevoogd, J. D.	Teaching time: distance education versus classroom instruction	IA EA
89-101	Molinari, D. L.	The role of social comments in problem-solving groups in an online class	LB SD
73-88	Rose, M. A.	Comparing productive online dialogue in two group styles: Cooperative and collaborative	LB SD
51-62	Edmonds, C. D.	Providing access to students with disabilities in online distance education: Legal and technical concerns for higher education	LB EA
39-50	Dupin-Bryant, P. A.	Teaching styles in interactive television instructors: A descriptive study	IA EA
21-38	DeTure, M.	Cognitive style and self-efficacy: Predicting student success in online distance education	LB EA
5-19	Kinash, S., Crichton, S. Kim-Rupnow, W. S.	Cognitive style and self-efficacy: Predicting student success in online distance education	LB EA
2003, 17			
235-246	Murphy, E., Coffin, G.	Synchronous communication in a Web-based senior high school course: Maximizing affordances and minimizing constraints of the tool	SD EA
221-234	Oriogun, P. K., Cook, J.	Transcript reliability cleaning percentage: An alternative interrater reliability measure of message transcripts in online learning	SD EA
207-220	Levy, S., Beaulieu, R.	Online distance learning among the California community colleges: Looking at the planning and implementation	LB EA

American Journal of Distance Education **Article Analysis (2002-2006)** **Year, Volume, Page Number, Authors, Title, Instructional Dimension**			
173-187	Lee, J., Gibson, C. C.	Developing self-direction in an online course through computer-mediated interaction	LB SD
161-172	Winston, B. E., Fields, D. L.	Developing dissertation skills of doctoral students in an Internet-based distance education curriculum: A case study	TA EA
145-159	Benson, A. D.	Dimensions of quality in online degree programs	SD EA
119-128	LaPadula, M.	A comprehensive look at online student support services for distance learners	SD EA
99-118	Woods, R., Ebersole, S.	Using non-subject-matter-specific discussion boards to build connectedness in online learning	SD EA
77-98	Roblyer, M. D., Wiencke, W. R.	Design and use of a rubric to assess and encourage interactive qualities in distance courses	SD EA
45-57	Williams, P. E.	Roles and competencies for distance education programs in higher education institutions	EA
25-44	Jeong, A. C.	The sequential analysis of group interaction and critical thinking in online threaded discussion	LB SC
7-24	Stein, D., Glazer, H. R.	Mentoring the adult learner in academic midlife at a distance education university	LB IA
2002, 16			
245-158	Cheurprakobkit, S., Hale, D. F., Olson, J. N.	Technicians' perceptions about Web-based courses: The University of Texas system experience	LB EA
227-244	Aragon, S. R., Johnson, S. D., Shaik, N.	The influence of learning style preferences on student success in online versus face-to-face environments	LB EA
205-226	Conrad, D. L.	Engagement, excitement, anxiety, and fear: Learners' experiences of starting an online course	LB EA
169-189	Thurmond, V. A., Wambach, K., Connors, H. R.	Evaluation of student satisfaction: Determining the impact of a Web-based environment by controlling for student characteristics	LB EA
151-168	Kanuka, H., Collett, D., Caswell, C.	University instructor perceptions of the use of asynchronous text-based discussion in distance courses	IA SD
131-150	Tu, C-H, McIsaac, M.	The relationship of social presence and interaction in online classes	IA SD
99-113	Neuhauser, C.	Learning style and effectiveness of online and face-to-face instruction.	LB EA
83-97	Allen, M., Bourhis, J., Burrell, N., & Mabry, E.	Comparing student satisfaction with distance education to traditional classrooms in higher education: A meta-analysis.	LB EA
65-81	Kemp, W. C.	Persistence of adult learners in distance education.	LB EA
37-52	Bisciglia, M. G., & Monk-Turner, E.	Differences in attitudes between on-site and distance-site students in group teleconference class.	LB EA
23-36	Litchfield, R. E., Oakland, M. J., & Anderson, J. A.	Relationships between intern characteristics, computer attitudes, and use of online instruction in a dietetic training program.	LB TA
5-22	Fahy, P. J.	Use of linguistic qualifiers and intensifiers in a computer conference.	LB SD

References

Bevan, N. (1998). Usability issues in Web site design. *Proceedings of Usability Professionals' Association (UPA)*. Washington, DC.

Mehlenbacher, B. (2002). Assessing the usability of online instructional materials. In R. S. Anderson, J. F. Bauer, and B. W. Speck (Eds.), *Assessment strategies for the on-line class: From theory to practice* (pp. 91-98). New Directions for Teaching and Learning Series, Number 91. San Francisco, CA: Jossey-Bass.

Mehlenbacher, B. (2003). Documentation: Not yet implemented but coming soon! In A. Sears & J. Jacko (Eds.), *The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies and Emerging Applications* (pp. 527-543). Mahwah, NJ: Lawrence Erlbaum.

Mehlenbacher, B. (2008). Modeling everyday instructional situations: Frameworks for distance teaching and learning. *Annual Conference on Distance Teaching and Learning 2008*. Madison, WI.

Mehlenbacher, B., Miller, C. R., Covington, D., & Larsen, J. (2000). Active and interactive learning online: A comparison of Web-based and conventional writing classes. *IEEE Transactions on Professional Communication, 43* (2), 166-184.

Nielsen, J. (1994). Heuristic evaluation. In J. Nielsen & R. L. Mack (Eds.), *Usability inspection methods* (pp. 25-62). NY, NY: John Wiley & Sons.

Nielsen, J. (1997). Usability engineering. In A. B. Tucker, Jr. (Ed.), *The computer science and engineering handbook* (pp. 1440-1460). Boca Raton, FL: CRC P.

Zaharias, P. (2004). A usability evaluation method for e-learning courses. *Unpublished Dissertation*. Athens, Greece: Athens U of Economics and Business.