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Designing online courses: User-centered practices

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Abstract

Teachers who develop Web-based courses must learn to act like designers; however, the type of design practice one undertakes has more than pedagogical implications. It can have political and ethical implications as well. In this article, I compare two models for design—systems and user-centered—each of which embodies different values. I argue that models of technology design can be applied to the development of Web-based courses and that various forms of user-centered design embody the values most compatible with writing instruction. While acknowledging the difficulties of enacting such models when developing Web-based courses, I present strategies for adopting a user-centered design paradigm in distance learning.

Keywords: Course design; Distance learning; Internet; Participation; User-centered design; World Wide Web

1. Introduction

It has become commonplace to suggest that distance learning via the Internet forces instructors to become designers as well as teachers. Many people observe, for instance, that instructors who once simply walked into a classroom to teach must now construct a virtual classroom before engaging in distance learning. That need to create online space has lead to many instructors viewing themselves as "builders first" and "teachers second" (Gillette, 1999, p. 23)—a significant shift in outlook and behavior. Design is inevitable, given the practices that instructors engage in when creating distance learning resources.[1] The need to design is obvious when creating new hardware or software—such as DAEDALUS or ENCORE XPRESS—or when creating Web-based courses from scratch, and it is no less necessary when instructors decide, say, whether to use MOO space or a chat function in WEBCT. Even the

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writing of Web pages involves design. If a Web page "provide[s] elements that allow users (readers) to interact with them," as Jose Borgés, Israel Morales, and Nestor J. Rodriguez (1998) pointed out, then "people designing pages for the WWW are actually designing user interfaces" (p. 137). Such seemingly minor decisions affect the kinds of opportunities for interaction that students face.

Consider my own experience for a moment: I had to make the shift from classroom teacher to designer when I received a grant to develop a Web-based version of an introductory course in technical writing. Once the euphoria of receiving the grant money wore off, nagging questions settled in: What do I do now? How do I act as a designer of a Web-based course? How do I define effective methods for developing content, selecting technologies, and organizing everything into a usable course? Figuring that familiar methods of course development would not always work,[2] I began looking for models of Web-based course development. Texts such as Lynette R. Porter's (1997) *Creating the Virtual Classroom: Distance Learning with the Internet* offered a good place to begin. This book covers issues from grant writing, to technology selection, to advertising; however, it did not always help me determine how to act locally. Although the book is filled with useful advice, it remains vague on how to determine needs in a specific setting. For example, the book tells me what a MUD might be used for (p. 121), but it does not offer advice on how to gauge the usefulness of such a technology for students at my campus. That most students commute, or come from far away and live on campus most of the time, or live on campus only from Monday through Thursday, or are adults, or come from well-to-do (or not-so-well-to-do) homes will influence not only the "feel" of the campus but also the trends[3] in students' responses to technology. Therefore, design (like research) should be "built out of a particular site (not simply selected from options outside the research context)" (Sullivan & Porter, 1997, p. 46).

Because distance education requires instructors to take part in unfamiliar design practices, they must seek appropriate models. Models of technology design may help not only because distance education courses require the use of communications and digital technologies, but also because such courses are technologies themselves. Consider that a technology presents a gathering of artifacts and processes designed to enable users to accomplish a desired task. A bicycle presents a collection of gears, ball bearings, wheels, and so forth, all of which enable a person (with the proper know-how) to travel from one point to another with less time and effort than traveling on foot; a computer presents a collection of chips, wiring, code, and so on, that allows humans (with the proper know-how and inclination) to store data and calculate numbers at a magnitude and speed that would be impossible for the human mind alone; likewise, an online writing course presents a collection of texts, communication tools, and virtual meeting spaces that enable a person (once again, with the proper know-how and inclination) to reach a number of goals that may not have been reached otherwise—at least that is the ideal. And just as a designer may want to understand the (sometimes tacit) know-how that users bring to bear when operating a computer, so too an instructor/designer should want to understand the know-how and inclinations that students bring to a course—knowledge of how to perform effectively as a student, how to read an assignment, how to complete a written assignment, and how to use networked computers to accomplish the previous three tasks.

Given that students and teachers must become users of technology to complete Web-based course requirements—that they must master not only course content and skills but the technological means of accessing that content and practicing those skills—it seems reasonable to apply insights of those engaged in technology design (e.g., those involved in usability studies and human–computer interaction) to new efforts in distance learning, insights into relationships between humans and technologies and into ways of developing technology to serve human needs, rather than vice versa. One of the most basic insights from technology design is that one key term, *design*, is used to designate numerous, sometimes conflicting practices. For example, *design* encompasses several distinct steps from "setting an agenda for future aims," (largely a question of ethics, of determining what ought to be) to "assembling means and resources for implementing that" (largely a question politics and power)[4] (Kress, 1999, p. 87). Setting an agenda inevitably requires us to accept some priorities while ignoring others. Some goals are left out. And, as we well know, struggles for resources (e.g., grant money, space, recognition) inevitably involve politics and power. Efforts at design are inevitably political, ethical efforts.

Because *design* carries such political and ethical dimensions, it must not be applied uncritically. Even decisions regarding a Web page as interface lead to an environment that inevitably carries political and cultural assumptions, as Cynthia Selfe and Richard Selfe (1994) suggest regarding operating systems. Moreover, we may carry with us non-networked assumptions about design that may or may not translate well to online environments. Thus, in the next section I distinguish between two approaches to technology design to draw parallels to alternatives in the design of Web-based courses.

2. Two competing models of technology design

Instructors considering ways to design an online course should understand distinctions made by writers such as Robert Johnson (1998b) and Terry Winograd (1995) between *systems* and *user-centered* approaches to technology design.[5] A systems approach to design represents the prominent approach to technology development, according to Winograd (1995, p. 118). The conventional practice of the systems approach is represented by the "waterfall model," which

> consists of a cascaded sequence of steps in which designers first ask the purchasers of the system what it is they want . . . then generate a formal specification of the functioning system, then ship that specification off to someone who will write the program. The finished program is tested to some extent against the specification, then is shipped back, installed, and employed. (p. 118)

The emphasis is on creating a formal specification and then building a system that meets it. Politically, owners who commission those specifications have the most influence over the design of the system; those with the resources necessary to purchase the system have the power to dictate the design, in consultation with the experts they hire to draft the specifications and execute the plan. (Thus, owners and designers appear high on the power[6] axis and to the far left of the time axis in Figure 1). As Winograd (1995) pointed out, the users

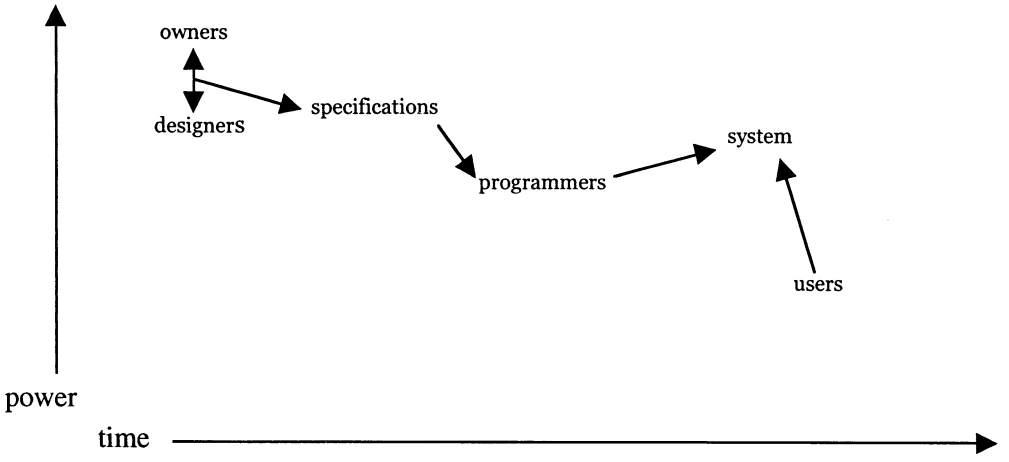

Fig. 1. A systems approach to technology design.

of such a system are mostly absent from this design approach—except merely to work with a technology once it is in place. (Thus, they appear low on the power axis and toward the right end of the time axis in Figure 1.) Such a model of design leads easily to the use of technology to deskill and even replace labor because the design ignores user knowledge and does not reflect user values.[7] The system has more power than the user because most often the latter has had little direct say in the design of the former.

In contrast, a user-centered approach to design doesn't necessarily start with the formal specification set by owner and designer. Rather, "user-centered theory argues for the user as an integral, participatory force in the [design] process" (Johnson, 1998b, p. 30). Following this approach, a designer may start by working with users, by examining their experiences with technology, and by trying to characterize the practical knowledge that users bring to their work. (Thus, users appear farther to the left on the time axis and higher on the power axis in Figure 2 than they did in Figure 1.) The purpose of such methods, Winograd (1995) wrote,

> is to uncover the user's experience of usability: that is, to identify dimensions of usability important to the user. Only users know their own experience of the product, how they are using tools to do their work, and their perceived requirements of their work. (p. 116)

As Figure 2 illustrates, designers taking a user-centered approach hope to create technologies for human use by beginning with the user's practical knowledge (rather than with a set of formal specifications). Specifications emerge from designers' observations of actual technology use, or in more participatory instances they emerge from interaction between designers and users. User-centered design recognizes users' *techne*, which Johnson (1998b) describes as "the human force, the human knowledge that permits control *through* technology" (p. 52; original emphasis). In its more participatory forms, user-centered design asks users to recognize that knowledge and bring it to bear on the design of technology. Politically, this model can give users much more power or influence over the system design.[8] Practically, it is more likely to result in designs users can use effectively.

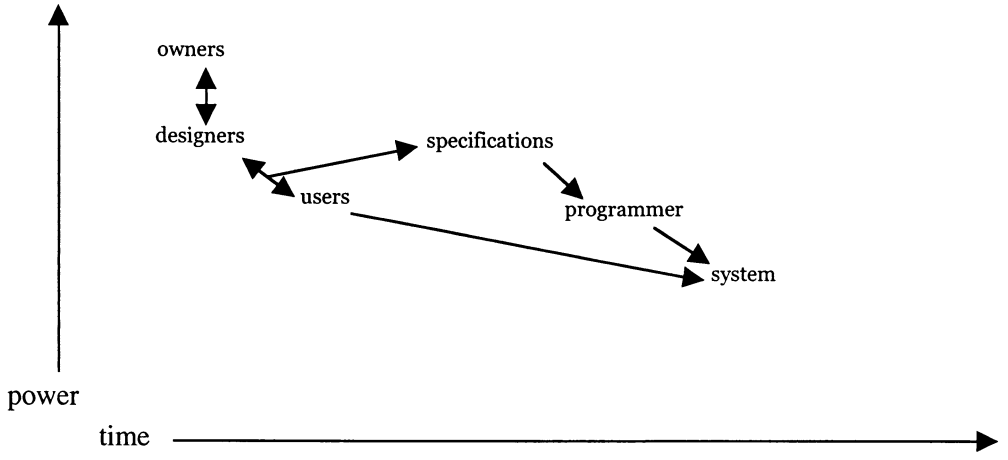

Fig. 2. A user-centered approach to design.

Systems and user-centered approaches can also be contrasted in terms of language theory. Pelle Ehn (1992) argued that a systems approach, as traditionally conceived, is "deeply embedded" in an Enlightenment theory of language (p. 116). The specifications are formed as a product of the mind of the designer, and their value is measured in terms of criteria such as consistency and mathematical elegance. "From this process," Johnson (1998b) wrote, "emerges a technological artifact that embodies the *designer's image* of the system" (p. 27; original emphasis). By focusing primarily on accuracy, designers buy into the belief that, by themselves, they can create a rational picture in language that others will simply be able to follow. (The concomitant assumption is that a breakdown in such rationally conceived artifacts is most likely the users' fault, rather than the system's.) However, "because there are different interests in the world," Ehn (1992) wrote, "we should always question the objectivity of design choices that claimed to flow from design as a process of rational decision making" (p. 117). Instead, "knowledge has to be understood socially" (p. 118). Given our understanding of constructivist theories, it is not surprising that Ehn (1992) claimed designers should focus "not on the 'correctness' of systems descriptions in design, on how well they mirror the desires in the mind of the users, or on how correctly they describe existing and future systems and their use," but on design as part of a socially constructed language game (p. 121).

It is not that specifications should be ignored, Ehn (1992) wrote; rather, their purpose should be reinterpreted. They should be considered as part of a "language game of design"—as a "special kind of artifact that we use as 'typical examples' or 'paradigm cases'" (p. 121). Specifications are effective in setting goals for design; however, they should be constructed socially, through interactions between designers, users, and tools. Such a social approach is more likely to incorporate the practical experience, knowledge, and values of users into the design of technologies relevant and suitable in practical use. Likewise, this approach is more likely to honor users' practical knowledge and values, thereby raising the odds for using technology to enhance workers' skills rather than to de-skill workers.

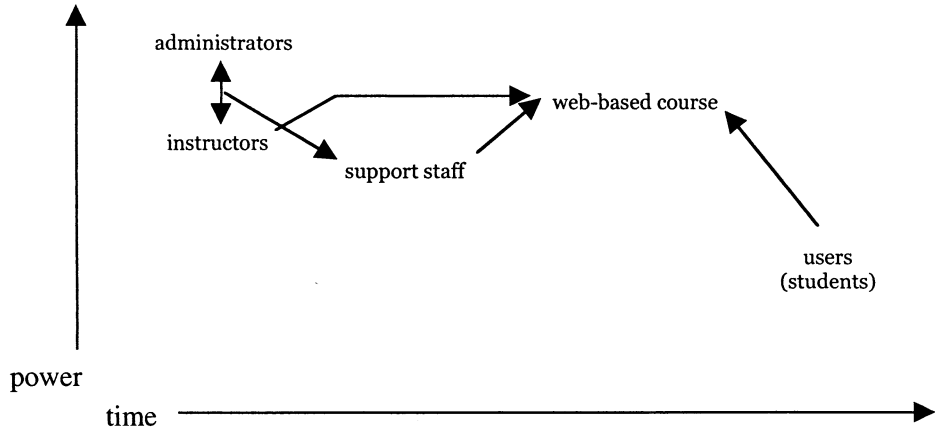

Fig. 3. A systems approach to Web-based course design.

3. What models of technology design have to do with instructional design

If designing a Web-based course is similar to designing a technology, then it seems appropriate to apply distinctions between systems and user-centered design to the development of such courses. If writing instructors, acting as designers, were to follow a systems approach, for example, they would set specifications (e.g., course goals and technological means for meeting those goals) and then begin creating a Web-based course to meet those goals. Students, acting as users, may not be included in course design until the course is underway (which is why students appear at the bottom of the power axis and the right end of the time axis in Figure 3.) In fact, Marilyn Cochran-Smith and Susan L. Lytle (1993) claimed that most curriculum development follows such a model (although they do not use the terminology). They wrote that curriculum is most commonly developed according to "pre-established calendars and formal procedures" that "generally involve discussion of objectives and goals as well as close examination and comparison of published materials" (p. 54). In other words, curriculum is designed according to formal specifications (procedures) and a consideration of existing technologies (published materials), rather than any apparent examination of users' experiences with them. Thus, specifications are set by using the discourse of the academic.

If discourses do act as terministic screens,[9] then control over the vocabulary and methods of a design project gives designers the power to predispose others toward certain assumptions and behaviors. (Again, design has political and ethical ramifications.) Such control is not necessarily bad, but it can have at least two unwanted effects. First, a designer's own discourse could blind her/him to several promising opportunities that might more easily be revealed by a different kind of discourse. For example, Orlando Fals-Borda (1991), a proponent of participatory action research, argued that academic researchers tend to be more "Cartesian" (i.e., more focused on theory) than others.[10] Academic discourses often focus too heavily on abstract concepts with little reference to their applicability in actual settings. Teachers focused on defining learning objectives, for instance, may have trouble focusing on

more mundane issues such as exactly when and how students will meet such objectives. For instance students in my class pointed out that a midnight deadline for projects worked much better for them than any other time because it allowed them to complete course work after coming home from work. I had been assigning 5:00 p.m. deadlines, essentially forcing working students (which they all were) to submit work at least eight hours before the actual deadline. I had set project goals while failing to account adequately for students' actual work habits. (If I were teaching a class of students who worked a 3:00 p.m. to 11:00 p.m. shift, the midnight deadline probably would be as difficult for them as the 5:00 p.m. deadline was for these students—thus, one mundane example of the need to engage students in candid discussions as part of a design process.) This is not to say that abstract, academic discourses are bad. Nonacademic discourses have failings as well. They can be immersed too deeply in local settings, thereby lacking the theoretical apparatus that might help research participants view their experiences into a richer context. A mix of discourses and people willing to listen meaningfully is needed.

Second, a designer's complete control over discourse could disenfranchise others with no experience in that register. One way to ensure that a research or design project doesn't become too one-sided or uncritical, Fals-Borda (1991) argued, is to make sure that change is envisioned through a mix of viewpoints that could be raised when different parties work together. If different groups work together equally, they may be likely to create new vocabulary as they reflect collectively. For distance learning, this may manifest itself in working with students to define course goals in terms meaningful to all parties. *Coherence*, for example, has a slightly different meaning to students and to writing teachers. I also discovered that a number of students did not know what I meant by *interface*. And I have a habit of using *exigency* when talking about problem solving because I want to avoid the negative connotations of *problem*. After all, exigencies can be opportunities, too. However, the term is unfamiliar for students, so we're still seeking a word that conveys a sense of urgency without the negative connotations. Engaging students in discussion about such key course terms not only reinforces knowledge, it ensures that students can function in the course.

Clearly, I had good reason to want to include a variety of viewpoints in the design of a Web-based course, to make my design process look more like Figure 4. "When the effectiveness of a system depends on how well it supports higher-order cognitive activities and social interaction," Paul Adler and Winograd (1992) pointed out, "there is often no substitute for direct user participation in the design process" (p. 5). Without such participation, we risk ignoring the knowledge, the *techne*, that users bring to bear on a given situation, and thereby designing a technology that renders that knowledge unusable. A Web-based course certainly constitutes a system designed to support higher-order cognitive activities; therefore, it seemed appropriate to me to want to enact user-centered, participatory design strategies. In other words, I wanted the genuine input of students and administrators early in the design process (to the left on the time axis in Figure 4). If a student-centered course is going to engage students as active participants, to enable them to set some goals for learning, and to recognize the *techne* that they bring to the class, then user-centered design values seem appropriate.

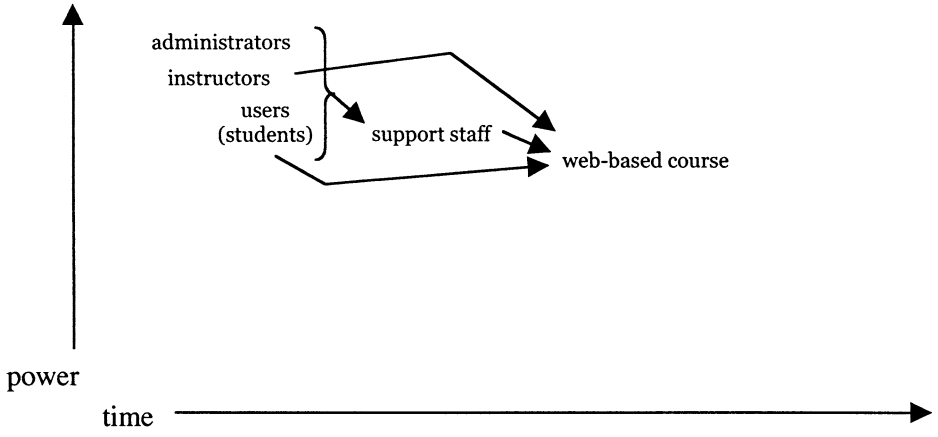

Fig. 4. A user-centered approach to Web-based course design.

4. The difficulties of enacting user-centered instructional design

Designers of Web-based courses must obviously make decisions based on their understanding of the probable needs, expectations, and behaviors of students at their own campuses. Consequently, they need "a reciprocal and participatory model" of course development for Web-based distance learning in the same way that writers or designers of technology need such models (Johnson, 1997, p. 362). We need ways to bring "the audience [students in this case] literally into the open, making the intended audience a visible, physical, collaborative presence" (Johnson, 1997, p. 363). We need to understand ways that our own students at our own campuses and in our own classes, produce the knowledge necessary to succeed in a Web-based course. Otherwise, we risk designing unusable courses. The key challenge, as Adler and Winograd (1992) wrote, "is how best to take advantage of users' [students'] skills in creating the most effective and productive working environment" (p. 3). And it is truly a challenge.

Although it seems admirable to inject democratic values into what often seems like undemocratic design practices, adapting user-centered, participatory design values to the development of distance learning has proven more difficult than I expected. Design strategies difficult enough to enact in workplace settings are even more difficult to enact when adapted to course design. One who hopes to enact user-centered methods of instructional design, especially the design of Web-based courses, cannot necessarily adapt methods from other fields in any uncomplicated way. User-centered design does not translate easily to instructional design (especially the reflective practice of an individual instructor) due to at least three factors: time, transience, and power.

Consider the time necessary for building the kind of genuine dialogue required for participatory forms of design. The need for generous amounts of time is illustrated by the experience of Muriel Harris, the founding force behind the Purdue University Online Writing Lab (OWL). Harris had little to go on when first thinking about developing the OWL, so she

surveyed students to see if they would like such a service. "When I first began considering the possibility of an email OWL," Harris wrote,

> I got perhaps a hundred students to talk about such a service. Several of the writing lab staff took piles of questionnaires into their writing classes for their students to answer, and we got students in the library to fill out some questionnaires too . . . Many of the responses were very enthusiastic, encouraging us to get started immediately because it sounded so great . . . It seemed to me that the message generally was that e-mailing the lab with questions would be a welcome addition to our services. (Blythe, Harris, Pollert, & Stellmach, 1998, p. 91)

Based on such a positive response, Harris believed that many students would use email; however, few used the service throughout the early years of the OWL. Though students expressed enthusiasm for an email service in general, they didn't use it once it had been implemented. Part of the problem was that the UNIX-based email system in use at that time made it difficult for most users to attach documents or read documents attached by others. Any initial enthusiasm for the email service was most likely dampened in part by available technologies and users' experiences with them. What Harris came to realize was that "[w]e cannot ask users to try out a system before it is constructed, and asking users to envision it did not seem to provoke any design insights" (Blythe, Harris, Pollert, & Stellmach, 1998, p. 92). The traditional, one-time interview/survey method didn't work in this case.

User-centered design, like critical and feminist research, should lead "[t]he researcher [to join] the participants in a theoretically-guided program of action *over an extended period of time"* (Lather, 1991, p. 64; added emphasis). Instructors lack this luxury, however, within the constraints of most academic calendars. Consider, for example, the difficulty of bringing roughly ten people (faculty, graduate students, and undergraduates) together for a study of networked conferencing protocols for writing center tutorials. (I participated in such a project involving people from two separate campuses.) We wanted to examine the effects of networked conferencing protocols (audio, textual, and video connections) on distance learning. Because all goals and methods were to be established collaboratively, it took three months for two groups to set research goals and to complete training for the project; it took another three months to conduct the trial tutorials. And we could meet for one last time only an entire month after the trials ended. In all, we took most of an academic year to do this project.

Efforts to bring users and designers together are difficult enough in a workplace setting where managers and workers may work with each other for a few years;[11] however, teachers and students seldom have that luxury in a world where the academic calendar can limit most instructor-student working relationships to a few months. Moreover, much can happen in an academic year. By the end of our one-year study, some undergraduate tutors graduated and moved on. They had little interest following up extensively on the project because their commitments lay elsewhere. Likewise, two graduate tutors graduated as well, and a third graduate tutor was focused on writing her dissertation. For teachers designing a course, user-centered strategies may be even more difficult because they cannot recruit the users, students, before registration is completed, they only have perhaps 16 weeks to work together, and students' main task in those weeks is to complete the course.

Even if teachers could recruit students with plenty of time for dialogue, differences in power and language complicate efforts. As Laurel Johnson Black (1998) wrote,

> Teachers are usually polished speakers in many registers, but many students, while polished speakers with peers, have had little experience speaking in extended turns in a classroom or in significantly reshaping academic discourse. Further, when speakers of different status are involved in talk, the speaker of higher status and power usually has control over topic acknowledgment and development. (p. 141)

If two people are to engage equally in dialogue, then both should feel able to speak and to listen; both should feel free to question the other and to steer discussion toward particular topics. However, engaging undergraduates in a discussion about writing and instruction can be difficult not only because they have not acquired the terminology to express their experiences in academic language but also because instructors are invested with the power of evaluating students' expression or performance. Participatory design aims at democratic engagement, but differences in knowledge, experience, and institutionally sanctioned forms of power make it impossible to equate the teacher-student relationship with other workplace relationships.

5. First efforts at adopting a user-centered orientation

Despite their allure, perhaps user-centered design strategies can be enacted only partially when designing courses taught online. At least, the ideal of engaging actual users and designers in dialogue during the early stages of the design process cannot work when it is impossible to know who the users of a distance course will be until after they have registered—at which point instructors are well into course design. Still, even if adopting user-centered design practices wholesale is impossible, I have discovered that I can at least adopt a user-centered attitude toward course design. The main goal I have adopted is viewing design as a continuous process and gathering input whenever possible. Thus, most examples of user-centered design strategies that I describe occur once a course is already underway.[12]

Because user-centered design recognizes user know-how, then the trick is prompting students to articulate that knowledge. One method is to offer an initial assignment asking students to explore their writing and computer habits. (I use this as part of an introductory memo assignment in my technical writing courses.) Realizing that students' initial responses to such an assignment might be vague because many have not been asked to discuss such issues before, I designed prompts to elicit meaningful responses:

- Describe your preferred writing strategy. For example, do you make elaborate plans first, or do you just start writing? When do you prefer to write? Why? Where do you write? Why?
- Have you used computers to write before? How do you use them? Do your strategies differ at work and when taking a college course?
- When has writing been easy for you? When has it been difficult? What factors influenced each situation?
- What kind of writing do you like to do? Why? What kind do you dislike? Why?

- Have past writing courses affected your writing? How? How do you hope this course will affect your writing?
- What kinds of resources and activities do you need in order to help you write successfully in this course? (For example, do you use the writing center?)
- What do you want to get from this course?
- Have you taken a distance learning course before? What was your experience like?

Such questions may be broached in class discussion (via asynchronous bulletin board applications or in chat sessions) and again as part of a more formal introductory assignment. Ideally, such questions, dealt with through phases of brainstorming and revision, prompt students to articulate what they know about being a writer and what they need from a Web-based course.

Through such an exercise, I try to determine whether I have offered enough support and whether I have placed that support where students can easily find it, while simultaneously engaging students in writing activities. I have gained a richer picture of the writing habits of a particular group of students—working adults in my Web-based technical writing course—and of their experiences with computers and with writing courses. However, I gain this valuable insight about the "users" in my course at a moment after the course is underway, when I am already offering online orientation sessions, and so forth. In other words, the insights come only when I can make little more than minor changes in the course.

Another way to prompt students to comment on course design and to orient them to the course, is to ask each student to create and comment on a course site map near the beginning of the semester. The purpose of such an exercise is to reveal students' conceptions of the Web-based course and its organization, making them more familiar with the course and its resources in the process. The assignment also fits nicely in courses that focus on information design because the class must employ a variety of text, space, and graphics to create a visual site map. If coupled with student critique (Does the map reveal weaknesses or absences in course design?), the exercise can prompt students to reconsider what they need from the course, and it can reveal what we can revise in the course.

The first time I taught via the Web, I asked each student to create a site map of the course. To do that, I set up an initial reading and then a discussion (again, via a bulletin board application) of site maps. Next, students reviewed Web site maps (both visual and indexical) and shared ideas on criteria for successful maps—How much detail should a successful map offer? What should a map enable a viewer to do? What is the role of graphics in a site map? Once criteria for successful maps had been established, students used the graphics capabilities of Microsoft WORD to create a visual map of the course. After reading articles on visual design and participating in peer reviews, students revised the maps. Ultimately, students became familiar all parts of the course while practicing basic skills in visual design. Like the introductory memo, however, the site map assignment provided insights at a point when large changes in the course were prohibitive.

Another way I kept in touch with students' experiences was to engage them in storytelling during regular updates or progress reports. For instance, I asked, "Tell me about a time when

this class was most difficult for you. What were you trying to do? What steps did you take to accomplish your goals? What did you hope would happen? What happened instead?" I pose such questions as part of regular "updates"—ungraded writing exercises in which I solicit feedback. My goal is that students' responses be descriptive without being judgmental. (The point, after all, is that students recognize the knowledge they bring to the course and examine how course design works with or against that knowledge.) Updates have proven most useful in showing me how I can help students succeed in the course. For example, several students commented that they had trouble anticipating assignments and planning their work from day to day. Because I posted the course calendar (which looks like a typical wall calendar) to show due dates as well as assignments, students were mostly working from day to day in the calendar. That is, a student would click on one day of a given week (usually the day on which they had accessed the calendar) only to discover that an assignment was due that day—a deadline they could have anticipated if they looked ahead in the calendar. As a significant number of students mentioned this dilemma, I changed the calendar to include a "Looking Ahead" entry in each day to forewarn students of upcoming deadlines. Such a small change improved the percentage of students submitting work on time. The regular updates have also made visible students' habits when they look for information in the course Web site. Like the other strategies I have mentioned, however, these assignments provide information when only small changes can be made.

One way to gather insights *before* a course begins comes from usability—the think-aloud protocol. As a course is being developed, an instructor may recruit a few test subjects ahead of time to determine if the design of a particular application or set of assignments meets users' needs. For instance, an instructor might observe a student completing specific tasks—an exercise, say, in which a student is asked to read a selection and then respond via a course bulletin board. The think-aloud protocol could help an instructor see whether the exercise is clearly written (a crucial thing considering that in distance learning an instructor can't be present in a classroom to respond immediately to questions that arise from the wording of an assignment), whether the subject can find the reading assignment, and whether she can use the bulletin board. Such protocols are also helpful in determining whether documentation is accurate and usable. For example, I conducted two such tests on a user's guide I developed for students using Lingua MOO. Those tests lead to significant revisions in the wording and organization of the user's guide.

Although such a protocol can effectively improve the usability of assignments and documentation, it has two weaknesses for user-centered design. First, the protocol is more geared to ensuring user-friendliness than engaging an instructor in user-centered design. The protocols are more summative (ensuring the usefulness of a nearly finished artifact) than formative (gathering input at early stages of design to ensure incorporating user knowledge and values from the start). Second, such protocols, conducted before a class convenes, engage representative subjects, rather than the actual users. Insights from representative users have always proven valuable for me. Nevertheless, more participatory approaches to design would engage actual users, something that is not possible with the protocols that I run before a course begins.

6. Pushing the envelope: making course design part of the course itself

The activities mentioned so far provide insights into student practices—insights to ensure usable course design. As has been mentioned, however, such input occurs once a course is in place. It is perhaps more *user friendly* than *user centered.* Could user-centered design be pushed further in course design and distance learning? I believe that it could.

If one key to genuine user-centered design is dialogue between interested parties, then an online course incorporating email, bulletin boards, and chat sessions could enable such dialogue. That dialogue, and the planning that arose from it, could even become part of the course itself. Course planning could be approached as an exercise in problem solving, task analysis, and critical thinking. Students could be prompted to define exigencies regarding their writing in relation to some other activity—say, writing and their other classes (in the case of students in some composition courses), or writing and their work lives (in the case of students in technical or business writing courses). They could define for themselves what they want to learn about writing, both as a practice and as a subject of inquiry. Discussion could focus on defining goals as a class and on personal goals for each student, also opening up a teaching opportunity—practicing the art of defining goals. Students could discuss (a) how best to reach those goals, possibly leading to a lesson in the art of asking research questions, and (b) how to have their performance graded, possibly leading to a lesson in the art of defining criteria. Such discussions could take place during the first week or two of a semester-long course.

The instructor would of course remain active throughout the process. The instructor does not abdicate responsibility or merely acquiesce to students' suggestions; it is the *mix* of discourses that is important. In genuine dialogue, John Dewey (1938) wrote,

> The teacher's suggestion is not a mold for a cast-iron result but is a starting point to be developed into a plan through contributions from *the experience of all engaged in the learning process.* The development occurs through reciprocal give-and-take, the teacher taking but not being afraid also to give. (p. 72; added emphasis)

The instructor has knowledge about teaching writing that must be brought to the discussion. The instructor would be both a participant and a resource during discussions, suggesting possible projects, prompting discussions on goals and criteria, and sharing knowledge and readings regarding what does and does not work in writing instruction. The instructor could provide materials and point to other Web sites devoted to writing instruction. Ultimately, the instructor and students could then set an agenda for the rest of the semester. Again, this activity would not be wasted time while students wait for learning to take place once the syllabus was completed. It could be approached as a problem-solving exercise.

An instructor would need to set out a few initial goals for students beforehand. Grading criteria, major assignments, and due dates would be handled collaboratively. The list of topics and exercises could look something like this:

- Introducing the course and initially discussing writing.
- Defining of exigencies and questions. What do you want to know about writing at work, school, or home (depending on the course)? What writing do you hope to do in the future? How could you prepare for doing this writing?

- Defining of tasks and projects. What kind of projects would best prepare you for the writing you want to do? What is known, generally, about good writing instruction? (Perhaps teacher offers synopses of research on the teaching of writing.)
- Defining criteria for evaluation. How should you be evaluated?

The instructor's and students' specific responsibilities in making decisions for each of these tasks are listed in Table 1.

At the end of these exercises, students and instructor may have with a greater sense of problem solving, a commitment to course goals, resulting from personal involvement in the definitions and a greater appreciation of the role of specific projects in meeting those goals.

Table 1
Tasks and responsibilities for an exercise in user-centered course design

Task	Instructor responsibilities	Student responsibilities	Decision-making responsibilities
Introduce course	Provide statement of purpose and initial, overall goals for the course	Respond to instructor's initial goals	Instructor sets basic goals at the outset
Define course exigencies and goals	Provide lessons on defining exigencies and goals; prompt students to think about their experience and expectations	Examine what they want to learn about writing, about how and where it's done, about how it's learned and practiced	Students define exigencies and goals; students and instructor discuss and define complete set of course goals
Define tasks and projects	Offer sample projects, point to other resources, offer insight on what does and doesn't work in learning	Select a set of projects; offer instructor guidance on setting deadlines	Instructor agrees to a list of possible projects; students vote on which projects to pursue
Establish criteria	Provide lessons on defining criteria; offer input on grading criteria	Define criteria for each project; argue for how criteria should be weighted	Instructor agrees to criteria and weighting provided by students

7. Conclusion

We often hear stories about the folly of planners and designers who ignore users' perspectives. Michele Simmons (1999) told a story about a team of government officials who created a county-wide emergency evacuation plan to placate a community's fears about the storage and disposal of toxic chemicals at a nearby army installation. When the team proudly shared the plan at a community meeting, members of the community asked, "What happens if an emergency occurs in October?" The puzzled officials were then informed that their plan

for evacuating a sparsely populated county would surely fail on a day when local roads were swelled by up to 50,000 visitors to a covered bridge festival (p. 97). Johnson (1998b) told a similar story about the value of engaging user knowledge in reducing traffic congestion (pp. 65–66). And James C. Scott (1998) recounted similar but more horrific stories in *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed.* Such stories illustrate the danger of ignoring contingent, local knowledge users and citizens use to thrive in a given setting. Teachers who design elaborate online resources without adequately consulting users of those resources risk committing similar, if less horrific, mistakes. By engaging students in discussions about the design of course resources and about the knowledge they bring to bear when working with such resources, and by adapting the course as student feedback comes in, an instructor could enact the values of user-centered design. Students, in turn, would have a greater say in defining a course they can truly use.

Notes

1. The term *design* seems appropriate not only because it describes what instructors must do when developing Web-based courses, but also because it confers status. As David S. Kaufer and Brian S. Butler (1996) wrote, the term is "a word of prestige" (p. 1). Commonly used in fields such as architecture, computer science, engineering, and graphic design, it has also become a key term in education and training (i.e., instruction design). Kaufer and Butler (1996) even devoted a book to the effort of classifying rhetoric as a design art—thereby improving its status by placing it with other design arts in the academy and with "activities that go beyond the walls of the academy" (p.7).
2. James Porter (1998) warned us that "when we enter the Internet, we bring expectations and ethics from the print world and from the face-to-face conversational world, ethics that do not quite correspond to the new medium we find ourselves in" (p. xii). Such warnings, combined with previous experience developing Purdue University's Online Writing Lab, made it apparent that new methods of development would be called for in my efforts to create a Web-based course.
3. I write "trends," because I do not want to essentialize. I do not claim, for example, that all women will respond one way to technology, a fallacy that Pamela Takayoshi (2000) rightly rejects.
4. I rely on Porter (1998) for distinctions between ethics, politics, and rhetoric (p. 38).
5. Although Terry Winograd (1995) uses the terms "*system*," "*contextual*," and "*ontological*," his distinctions revolve around whether one focuses on formal specifications or user's experiences with technology. Thus, his distinctions share many similarities with Robert Johnson's (1998b).
6. Here *power* refers to the extent to which a person can influence the shape of a technology. The people who purchase a system have the most power because they dictate what the system ought to do. Designers have power because they figure out how to make a system do what purchasers want. In the computer industry, programmers have less power because they write code to meet the system designer's speci-

fications, but often have little power over the actual design itself. Users usually have even less power because usually they can choose only to work with or reject a finished system.

7. As Bruce Horner (2000), quoting K.C. Kusterer (1978), recently wrote, "managers—not recognizing [users'] knowledge, and concerned only with increasing exchange value (profits)—frequently take actions to make 'whole subjects of working knowledge obsolete, disrupt communal networks, and thus undermine or eliminate entirely the resources that the workers have used to render their jobs meaningful and to turn their work activity into life activity'" (p. 372).
8. We should heed Johnson's (1998b) distinction between "user-friendly," which "can describe a technological interface that is easy to use but may not necessarily be in the best interest of the user," and "user-centered," which hopes to take "the user's situation" into account (pp. 30–31). A focus on the user does not necessarily lead to a design that acknowledges users' knowledge and experience. (See also Sullivan & Porter, 1997, p. 38.) Designers could have their own specification preferences, and they usually have the power (conferred by their specialized knowledge) to assert that preference. Participatory design projects such as the ones attempted in Scandinavian countries move beyond contextual design by including an overtly political component as designers work with unions to create systems that enhance worker's traditional skills, rather than automating work or replacing workers.
9. Although I do not argue that any particular discourse determines behavior and reality, I do accept the argument that discourse plays a significant role in prompting our constructions of reality and predisposing us toward subsequent behaviors. Discourse "creates meaning," as action researchers Morten Levin and Davydd J. Greenwood (1997) argued, "because it identifies and generates actions that are meaningful for the actors" (p. 151). We can talk about how discourse may nudge us toward certain actions without having to claim it causes behavior in the same way that the completing of an electric current causes a filament to shine in a bulb.
10. To complicate matters, an observer may be subject to numerous discourses at any given time. According to postmodern geographer David Harvey (1996),

    > Discourses vary from the expert discourses of science, medicine and the professions, the particular working discourses that attach to institutions or divisions of labor in material production and reproduction, through to those most general discourses about society, self, and nature including those of parody, humor as well as religion, nationhood, and political identity. (pp. 88–89).

    In any situation we may move between discourses of the academy, our communities, our nation, and other affiliations.
11. Proponents of participatory design such as Pelle Ehn (1992, 1988) and Susanne Bødker (1991) cite examples from union shops, where the workers have considerable power and experience.
12. As I share possibilities here, note that I am writing about reflective design practice, not necessarily about larger-scale research projects. I am interested in developing practices that instructors can use to develop distance learning resources—practices

providing information to allow instructors to make informed decisions regarding course design.

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