VIRTUALPOLITIK:
OBSTACLES TO BUILDING VIRTUAL COMMUNITIES
IN TRADITIONAL INSTITUTIONS OF KNOWLEDGE

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Elizabeth Losh
University of California, Irvine

ABSTRACT

Digital collaborations are often stymied because institutions of higher education are increasingly divided between two cultures: the culture of knowledge and the culture of information. Campuses primarily remain institutions of knowledge, although practices of information acquisition can no longer be ignored, especially since the advent of networked computing and study with digital texts. Yet the traditional division of labor and the ownership of intellectual property within the academy are threatened by digital collaborations; and the claims of information theory, which is associated with epistemologies of uncertainty and probability, challenge conservative ideologies of university culture. As a result, policies for the development of hybrid instruction and digital archives are often dictated by "Virtualpolitik," or the *Realpolitik* of virtual institutions, in lieu of a long-term vision for meaningful institutional change. This paper examines four Internet-based initiatives designed to improve cross-campus teaching and learning in California public universities – MERLOT, CPR, UCWRITE, and SPIDER – and argues that effective programs with lasting legacies take advantage of a "bazaar" rather than a "cathedral" development model and incorporate meaningful "information literacy" objectives that go beyond the mastery of particular terms and tools.

> *Where is the wisdom we have lost in knowledge?*
> *Where is the knowledge we have lost in information?*
> T. S. Eliot, "The Rock"

In his 1959 essay *The Two Cultures*, C.P. Snow described the "intellectual life of the whole of western society" as divided between "two polar groups": those of the sciences and those of the humanities.[1] Now it is possible that institutions of higher education will eventually be divided into two even more incompatible communities of scholarly

association: the culture of knowledge and the culture of information. This division can make fostering collaboration between academics, especially those from different fields, more challenging as faculty members collectively seek to establish common objectives for literacy competence or to integrate new technologies into shared pedagogical practices. To illustrate how the presence of competing ideologies among stakeholders in higher education obstructs collaboration, I will examine four on-line collaborative efforts designed to improve the quality of instruction that undergraduates receive: MERLOT, CPR, UCWRITE, and SPIDER. All of these projects received public funding, all consequently manifested aspects of the digital politics of "the virtual state,"[2] and all originated with faculty serving large and culturally diverse student populations in California.   These projects, as the public organs of incipient virtual communities, demonstrate that the culture of knowledge and the culture of information can often work at cross purposes, at least at this particular historical moment at this particular economy of scale in higher education.

The Cultural Meaning of Information as Distinct from Knowledge

Definitions are important here, particularly since in everyday language, "knowledge" and "information" are generally treated as nearly interchangeable. It is assumed that "libraries contain knowledge," just as "libraries contain information." Or in the same way that "instructors transmit knowledge," it would seem that "instructors transmit information." In common parlance, "knowledge" and "information" sound like synonyms. *Webster's Dictionary*, slightly more precisely, defines one word in terms of the other, so that "information" is classified as the "communication or reception of knowledge or intelligence."[3]   The *Oxford English Dictionary* goes further to acknowledge the term's etymological history by including social practices of interpretation in its definition, so that the entry on "information" encompasses the "formation or moulding of the mind or character, training, instruction, teaching; communication of instructive knowledge."[4] In their work on literacy and numeracy, Michael Hobart and Zachary Schiffman have traced the word back to classical culture to consider how antecedents of the term "information" actually functioned in the rhetorics of the ancient public sphere:

> The term itself traces back to the Latin verb *informare*, which for the Romans generally meant 'to shape,' 'to form an idea of,' or 'to describe.' The verb, in turn, supplied action to the substantive, *forma*, which took varied, cognate meanings that depended mostly on context. The historian Livy used *forma* as a general term for 'character,' 'form,' 'nature,' 'kind,' and 'matter.' Horace applied it to a shoelast, Ovid to a mold or stamp for making coins, while the wily Cicero, among other uses, extended it to logic as 'form' or 'species,' his rendering of the Greek . . . The practical notion of 'form' as a last, mold, or stamp remained closely tied to its more abstract, logical meaning, which paired content and container.[5]

Hobart and Schiffman claim that the concept of information can be tracked even farther back to its historical roots in the origins of writing. Thus information is created at the place where technology and rhetoric intersect.

However, it is the technical definition of the word "information," as it is used by mathematicians and computer scientists in relation to "uncertainty," which is central to my argument. From the perspective of information theory, information is linked to a fundamentally different paradigm for the interpretation of ambiguity in communicative

exchanges from that of knowledge. As Bell Labs scientist Claude Shannon explains in his 1948 groundbreaking article, "A Mathematical Theory of Communication," the quantity of information transmitted is determined by the amount of uncertainty at issue in a given situation.[6]   For example, I might say that more information is conveyed by the next letter of the sequence C-H-O than by the next letter of the sequence C-H-O-C-O-L-A-T. So, in my example, the components of the first message, C-H-O, could be a restaurant order for "chocolate," but they could just as easily be forming the letters for "chop suey" or "choice steak"; in contrast, the completed contents of the second, longer message, C-H-O-C-O-L-A-T appear easier to predict.[7]   Shannon's collaborator, Warren Weaver, went so far as to say that information has "nothing to do with meaning,"[8] although it does describe a pattern. This is because information refers not to a single message, but probabilistically to an entire set of possible messages.

This opposition between information and knowledge has important philosophical ramifications, since these competing ideologies have shaped the history of communication since at least the 4th century B.C.E. when, as Dilip Goankar explains, "Aristotle replaces Plato's binary opposition between reality and appearance with his own binary opposition between the necessary and the contingent."[9]   Given the epistemological positions of the two ancients, it seems to follow that Plato is the consummate philosopher of knowledge, and Aristotle is the philosopher of information.[10] Colleges and universities have been predominantly Platonic institutions for a long time,[11] and there are still many defenders of the idea that the only objective of an undergraduate education should be to enable a competent student to learn to differentiate between the seductions of appearance and the rewards of reality. [12]

Now higher education must also construct new academies of information. It is not enough merely to teach students to aspire to the manufacture of knowledge, destined be inventoried in the annals of disciplinary authority, college graduates also need to know how to interpret information through the exercise of probabilistic reasoning.[13] Yet, even if the critical epistemological paradigm shift has already occurred, it is important to note that, as Jean-François Lyotard once cautioned, "the transmission of knowledge should not be limited to the transmission of information," since effective education must "include training in all of the procedures that can increase one's ability to connect the fields jealously guarded from on another by the traditional organization of knowledge."[14]

Campuses across the country have invested in educational initiatives that are intended to link the culture of knowledge with the culture of information. Philanthropic foundations have encouraged experiments with "project-based," "problem-based," or "inquiry-based" learning,[15] even in large lecture classes that conventionally have little unpredictable student participation or spontaneous interaction with faculty. Such programs emphasize asking questions as well as finding answers and stress collective interpretation alongside individual production. The presence of these programs represents an implicit acknowledgement of the impact of contemporary information theory on traditional pedagogical infrastructure, because these curricula direct students' attention to the role of coding and decoding information and to the importance of considering the presence of possible "noise" in any communicative channel.[16]

Academic programs and departments have also partnered with units like the library or instructional technology to foster "information literacy" initiatives. These initiatives include the enumeration of particular curricular objectives in large-enrollment courses, specific requirements for the undergraduate degree, and even participation in national

projects on assessing intake and exit information literacy competence.[17]   However, it remains an open question as to who will ultimately define information literacy for higher education. In other words, will groups like the American Library Association proactively offer enrichment with a multi-modal range of information literacy experiences, or will campuses be forced to react with remedial courses to perceived deficiencies in incoming students that will be conveniently identified by the Educational Testing Service through the single measure of a multiple choice test?[18] Perhaps senior administrators at individual institutions will inevitably need to take a larger role, since there is such wide variation between campuses in their library facilities, technological resources, network capacity, and distribution of faculty specialists that a one-size-fits-all approach to information literacy may be inappropriate at present.

Understanding the social context of these new literacies is particularly important because the rise of digital media and networked communication has fundamentally altered the traditional features of the learning situation. At the most basic level, students expect to use communication tools like webpages and e-mail in their coursework, because these genres are common in professional and leisure communities. Faculty also want access to "smart" classrooms in which they can easily showcase digital artifacts from online archives, demonstrate appropriate searching and browsing strategies, or integrate electronic media at key moments. More importantly, if conventional higher education is becoming increasingly hybridized by practices developed for distance learners, advocates for this process hope that this will create the best of both possible worlds. If conventional education emphasizes the teacher, the traditional archive of knowledge, and rhetorical situations, and distance instruction emphasizes the learner, the resources of digital collections, information literacy, and specific quantifiable learning outcomes, then the hybrid combination of these approaches is intended to highlight the relationship between learner and teacher, the synergy between digital and physical archives, the dynamic of information and knowledge, and the connections between rhetorical situations and learning outcomes.[19]

As educational policy makers put forth pronouncements about how best to create intellectual communities around the information/knowledge matrix, it is useful to look closely at how particular terminology is deployed. For example, the Boyer Commission report on higher education asserts that the current situation of learning on college campuses must be changed, chiefly because "students graduate having accumulated whatever number of courses is required, but still lacking a coherent body of knowledge or any inkling as to how one sort of information might relate to others."[20] The commission argues that students are deficient in access both to knowledge and to information, but clear distinctions are made in the language cues of the Boyer report: "knowledge" is associated with accretion into a "coherent body," while "information" can be separated into "relatable" "sorts."   In other words, one activity is associated with synthesis, while the other is associated with division.

Compared to this cautious advice for reform aimed at scholarly institutions that purvey both knowledge and information, the postmodern pronouncements of hypertext scholars appear to be gleefully sounding a death knell for the very institutions that house their research. Digital visionaries like Richard Lanham go so far as to declare that, since the end of books is fast approaching, traditional organizations of knowledge associated with the codex form are in their final days as well.[21]   Yet I would argue that it is precisely the radical nature of the paradigm shift toward a coming information culture that fortifies the reactive and contradictory discourses of traditional institutions of knowledge. The

axiomatic principle that I call *Virtualpolitik* (or the *Realpolitik* of virtual institutions) may explain why rhetoric around digital technology often champions forms of pseudo-collaboration disguised as community. Because the proximate, pragmatic interests of stakeholders are rewarded by the strategic consolidation of power, initiatives for sustainable digital collaboration in higher education are often stifled in favor of virtual enterprises that replicate conventional discourses and consequently also fail to succeed at the specific task of improving information literacy and enhancing learning and teaching in the long run.[22]   Institutions of knowledge can be remarkably resistant to change, particularly when, as Michel Foucault has asserted, knowledge is a form of power and power is a form of knowledge.[23]   Thus the traditional disciplines police boundaries, authorize access to professional privileges, control the production of authorship, and enforce the rules of academic discourse.

Digital Divides and Traditional Barriers

Pre-existing conditions in higher education make digital collaboration extremely difficult to achieve. Many competing parties have membership in academia: professors, teaching faculty, graduate students, undergraduates, administrators, alumni, and life-long learners. As Clark Kerr once observed, the university really is a "multiversity."[24] Most obviously, institutions of higher education are fundamentally bisected by a divide between teaching students and conducting scholarly research, a split that I argue has been replicated in the online manifestations of academia as well. Current trends favor the consolidation of traditional boundaries between research and teaching borrowed from "real" bricks-and-mortar universities, which are reconstructed in the "virtual" universities of the near future in which text encoding projects for elite groups of scholars are separated from distance learning for the masses.[25]

Habermas's opposition between "lifeworld" and "system" can also be applied to the instruction/research dichotomy because faculty and graduate students must be prepared to move from one institution to another. Such individuals teach in a "lifeworld" of dynamic discursive interactions in localized classrooms with constantly shifting themes and situational horizons, yet they also must become published scholars in a peer-reviewed "system" in which professional discourse must be codified, homogenized, and commodified for highly impersonal academic exchange and consumption.[26]   In this system, artifacts of digital collaboration are excluded from the rewards associated with traditional publications, as a recent College Composition and Communication study made clear, in which fictional tenure-review cases of faculty using and creating electronic texts and digital media were judged to be evidence of inferior scholarship by real department heads and deans.[27]   Furthermore, digital materials that may have considerable use value in a particular classroom or lecture hall may have little exchange value for colleagues teaching other courses on other campuses.

Even if digital works are granted value as commodities of legitimate scholarship, the ownership of this intellectual property can be contested, especially if the final result is a collaborative product, as it invariably is, or if the project is developed with a university's computer hardware, software, and networks under the any of the conditions of work-for-hire. Ideologies of ownership and freedom imported from traditional cultures of knowledge potentially obstruct digital collaboration,[28] and governing bodies that approve the most liberal guidelines for custody of intellectual property by faculty members still may exclude certain members of the university community from proprietary positions.[29]

The division of labor among different groups already determines the political, economic, and cultural value of each sector of academic work. Caste systems can be insidious that separate "knowledge workers" from "information workers."[30] In the digital multiversity, research faculty are generally designated as the knowledge workers, while librarians and instructional technology specialists are categorized as information workers. Collaborative discourse between these groups is hampered by perceived asymmetries in class, and teamwork is stymied by inequalities in rights and privileges.

Furthermore, the manufacturing model of universities as a central site of the "knowledge industry" exacerbates conflict between stakeholders, particularly when "labor" and "management" face off as adversaries, regardless of whether or not electronic resources are perceived to increase or decrease the workload of teaching assistants and adjunct faculty governed by collective bargaining agreements. For example, a recent CCCC position statement on digital labor assumes the following generally held postulate: "Work with technology is very time-consuming."[31] By this logic, organized labor leaders would be justifiably suspicious of the additional tasks of managing an electronic classroom, as much as undergraduate consumers may demand the convenience of those services. Yet a double bind exists. Collaborative efforts designed to use technology to develop time-saving programs, such as the SPIDER program with which I was affiliated, can be criticized for valuing efficiency, especially when unionized classroom instructors fear that technology will replace their pedagogical labor with automated, standardized, or "outsourced" content.[32]

When the economy of instructional time or wages is not at issue, professional expertise and specific job skills can be the determining factor in the success or failure of digital collaborations. Manuel Castells has argued that despite rapid amelioration of some inequities in on-line participation, the "digital divide" is being re-inscribed along several axes. In particular, he notes that there is a divide between the "interacting" and the "interacted" in which the former "select their multidimensional circuits of communication," and the latter are "provided with a restricted number of prepackaged choices."[33] At a recent Computers and Writing conference, Stuart Moulthrop highlighted the surprising level of technological ignorance in academia, since only a few faculty members working in hybrid learning environments can actually manipulate source code or provide more advanced programming services for the greater pedagogical good.[34] Similarly, Gregory Crane has lamented the shortage of scholars in the humanities who are knowledgeable about the most basic conventions of mark-up language for creating usable metadata for digital archives.[35] This is not surprising, given that faculty members who might have once been considered "early adopters" often still depend on tools like PowerPoint that emphasize rigid one-way presentation of information to passive audiences,[36] and others are reluctant to experiment with unfamiliar digital collections beyond the electronic resources in which they are already well-versed.[37]

Within an emerging information community there can be fissures as well, even if all participants are manifestly competent in their assigned roles. Sometimes the divergent practices of different cultural groups within information networks can only be explained by their differing ethnographies.[38] Narratives, rituals, and mythologies around information exchanges are certainly complex, and the evolving science of human-computer interaction needs more input from psychologists, sociologists, and anthropologists. Christine Borgman has shown how practices and behaviors of – for example – something as simple as "searching" or "browsing" can be constituted differently by members of different groups, particularly when a broad array of

stakeholders share information resources. Borgman's work about the cultural differences between librarians, computer scientists, and library users grapples with the unique contradictions inherent in the fragmented space of a digital library or the online classroom.[39]

Standard Approaches to Networked Electronic Collaboration in Higher Education: MERLOT, CPR, and UCWRITE as Representative Case Studies

The rise of new virtual institutions of pedagogical and archival authority for social actors who depend increasingly on websites, e-mail, and other forms of digital communication in pursuit of convenience, access, mobility, interactivity, and searchability has fostered development of digital libraries and scholarly text-encoding initiatives, as well as distance and hybrid learning projects that use online delivery of course content. It has also encouraged collaborative initiatives around activities of pedagogical labor and the enrichment of the profession of teaching in a discipline community.

When considering the rise of digital collections in the twenty-first century academy, the history of software engineering provides some explanation for how the design of specific computer architectures evolves in given institutional settings. Eric S. Raymond's comparative study of Microsoft Windows and Linux proposes two possible paradigms: "the cathedral" and "the bazaar."[40] Competing operating systems developed differently, Raymond argues, because one was "carefully crafted by individual wizards or small bands of mages working in splendid isolation, with no beta to be released before its time" and the other formed out of a "great babbling bazaar of differing agendas and approaches," despite the fact that the bazaar approach initially seemed only sustainable as a "coherent and stable system," if a "succession of miracles" occurred. These patterns of acquisition and exchange of cultural capital are also useful for understanding the case studies in this paper.

An exemplary program like MERLOT (the Multimedia Education Resource for Learning and Online Teaching) claims to be many things to many stakeholders. The MERLOT "Tasting Room" homepage describes it as "a growing catalogue of online materials," "a consortium of partners," "a community of members," and "a technology initiative."[41] Simultaneously, MERLOT promises the visitor access to a digital archive, a capitalized start-up opportunity, an inclusive social network, and a program to access the very future of the culture through digital means. MERLOT also bills itself as an information literacy project, despite the orientation of its rhetorical appeals toward a more limited form of "tool learning." The informational video emphasizes scenes of dozens of intent students working at keyboards in front of computer screens. The same video presents MERLOT as a faculty solution to pre-Google frustration with competing commercial search engines. The announcer explains that MERLOT will make "the web more useful for educators" with searching and browsing capabilities. Like other distance learning initiatives, such as those championed by the Pew Report, MERLOT showcases vivid and interactive multimedia as well, and features testimonials by a geneticist and a mathematician about the pedagogical value of MERLOT's animations. It even appeals to faculty culture by emphasizing the prestige and privilege associated with NSF funding and the mechanism of a peer review process. Thus it characterizes itself as endowed with concurrently hierarchical and peer-to-peer organizational structures by pointing out its use by "systems of higher education" and by the "learning community." Although the video claims that "in the end it all comes back to the students," MERLOT affiliates itself

with *Lehrfreiheit* more so than *Lernfreiheit*, as the inclusion of specific appeals to faculty-centered academic freedom in its materials makes clear. For example, one MERLOT booster declares that the program "keeps teachers, faculty, and freethinkers in control of the educational process rather than businessmen or investors." It is on this note that the video ends, with a finale about "learning is a social activity" and the importance of "collaborations."

Nonetheless, MERLOT is far from the "open source" or "freeware" model of Raymond's Linux bazaar. MERLOT makes clear that some member institutions have more power in designing the information architecture of the site than others, and that principle investigators who have secured funding will control how the peer-review function operates. There are also limits to users' privacy in explicit online statements about the use of cookies on the site and the collection of personal information.[42]   Perhaps most surprisingly, institutional membership in some "communities" actually entails the payment of substantial cash fees that can account for tens of thousands of dollars from constrained campus budgets.

CPR or "Calibrated Peer Review" similarly appeals for institutional participation by drawing attention to aspects of its funding structure. Like MERLOT, CPR advertises the magnitude of involvement by NSF granting agencies and "consortium" partnerships with quasi-state and corporate entities.   It also uses the rhetoric of "peer review," as MERLOT does, to explain its pedagogical mission. The website explains that CPR's origins were ostensibly student-centered, since it began in the molecular biology department at UCLA, where faculty were concerned about low MCAT scores and possible correlations with the small number of required writing assignments in courses in the discipline.

According to the CPR "Tour," student participants move through three hierarchies of competence when using the online interface: instructional evaluation, peer evaluation, and self-evaluation. First, instructors evaluate set writing samples with a numerical score based on mechanical "five-paragraph-essay" traits like the presence of "three reasons" in an argument and organization around "topic sentences." Then students practice evaluating the same writing samples with the same quantitative rubric and check their progress, matching their instructors' scoring by observing their performance on color-coded bar graphs. Students are told to "compare your answers with your instructors' answers." Little is told to students about communication, persuasion, or the presentation of information. Eventually course participants are allowed to perform this calibration exercise on the writing sample of their peers, so that the instructor never actual sees any "live" writing by enrolled students. Calculations of "standard deviations" are considered sufficient to measure the students' progress as writers, and the capstone "self-evaluation" that students perform only accounts for 10% of the program's total scoring mechanism. A pre-evaluated catalogue of writing samples is available for particularly time-efficient instructors, and "learning goals" and "guiding questions" are suggested as optimal for students, but the presence of these pedagogical and rhetorical cues is not guaranteed.

One could say that CPR is all system and no lifeworld, communicative action with no second person discourse, an automated series of assignments that the instructor never actually reads. Although CPR ostensibly emphasizes a structure of "peer review," the review process is aimed at quantitative activities of calibration totally divorced from rhetorical context.   It is ironic that the use of the metric system or "SI" by the "scientific

community" is the topic of the sample writing prompt for a program so completely absent in any concept of community. Unlike peer-to-peer networks that encourage online communities by facilitating spaces for chat and messaging, the atomistic organization of CPR discourages students from occupying positions of agency either with each other or with the instructor.

However, it is precisely because the program lacks a particular discourse context that CPR's advocates feel free to claim wide application to a variety of audiences, despite the fact that this confidence flies in the face of the prevailing skepticism of those who have questioned ill-founded universalism of a long history of abortive Writing Across the Curriculum initiatives in conventional composition instruction.[43]   As the CPR website asserts, "Although CPR stems from a science-based model, CPR has the exciting feature that it is discipline independent and level independent. When children first begin to write a paragraph, they can use CPR profitably, and yet the same program serves college and university students as well as graduate and professional students."[44]

CPR also promulgates outdated stereotypes about technology in which efficiency is created not through collaboration but though mechanical substitution. For example, a 1999 monograph from the influential Pew Learning and Technology Program typifies what I would characterize as an ossified privileging of particular types of web-based programs over more flexible and communitarian ones. Although the Pew report's call for greater vividness and interactivity in learning environments initially appears admirable,[45] insidious assumptions in this document devalue members' participation in the rhetorical community of a campus and discount the importance of hybrid teaching forms.[46] In particular this document assumes that writing-intensive courses would be inferior candidates for the allocation of funding for bells-and-whistles instructional technology. Of course, there would be great difficulties implementing such technology in writing courses if the paradigm is automated computerized feedback and assessment. [47]   Even relatively simple "grammar checkers" with years of testing and capital investment have a level of accuracy that cannot compare to a human editor, and automated feedback on conceptual and organizational features of writing will likely require several revolutions in AI technology.

At a time when campuses are explicitly being encouraged to emulate the features of state-of-the-art corporate culture, CPR and other automated writing assessment tools actually push educational institutions to adopt an outmoded industrial-age business model that emphasizes mechanical automation and the substitution of meaningful intellectual labor by mindless technologies. In contrast, Michael Schrage argues in his book *Serious Play* that networked computers with powerful software have fostered a different kind of corporate culture based on simulations and prototypes, which amounts to much more than the quantifiable output of machines.[48] Contemporary corporate culture promulgates "quick and dirty" design with multiple prototypes, simulations, and active debate about usability. Richard Lanham points out that this "fictionalized modeling" characterizes a range of "real" simulations both inside and outside of academia: "All kinds of situations are being modeled – a literary critic might say dramatized – interactively."[49] Toward this end, multiple stagings of new instructional technology under the direction of a rapid-response pedagogy could create better educational hypertexts than those created with an emphasis on short-sighted cost-conscious consolidation and a "downsizing" of live teaching.

In favor of one aspect of the CPR model, it could be argued that the program does emphasize the connection between reading and writing by structuring the assignments around "source material" that could conceivably serve as discursive models. CPR explains that such "source material" could include "web sites, articles, text books, pictures, movies, animations, etc." For example, the sample assignment on the CPR tour includes websites on "The Measurers," "A Dictionary of Units," and an "HTML tutor." It also covers a minimal component of "tool literacy" since the program includes instructions about the "text entry" process, which highlight possible pitfalls in formatting and the wisdom of utilizing the system's HTML preview capability. Yet students have little pedagogical context and almost no metalanguage with which to understand these information literacy experiences.

The approach of UCWRITE or "The U.C. Writing Institute" would initially appear to be the opposite of CPR's a-rhetorical design, although both programs – like SPIDER – received grant money from the University of California's system-wide Teaching and Learning with Technology Collaborative Grant project. Founded by UC writing program administrators, the "philosophy" page of UCWRITE repeats the importance of a "rhetorical approach" to instruction in communicative competence, and – unlike CPR – UCWRITE questions the utility of employing rigid formulas in writing, such as the five-paragraph essay. However, like the CPR automated peer-review program, UCWRITE emphasizes that responding to texts is central to the activity of writing. As UCWRITE explains, "Most university-level writing is a response to other writing . . . To complete most academic writing tasks successfully, students need to be able to read critically."[50]

Unfortunately, UCWRITE was constructed to be a cathedral rather than a bazaar. Diagrams and mission statements emphasize centralization and hierarchy. Instructors are assumed to conform to a commonly held ideology. The members of the anonymous collective of authors of UCWRITE assert, "In spite of their variety, the programs are based on several shared beliefs about writing and writing instruction,"[51] and indeed the FAQ section of the document makes clear that a central tenet of these writing programs is that they assign work that is more demanding and intellectually rigorous than high school.[52] Yet Bill Readings has criticized the emptiness of monological discourses unified around "the idea of excellence" when compared to the possibilities of a more productive "community of dissensus."[53] Despite these protestations that a common cultural cohort exists, however, the lack of substantive community membership in UCWRITE is made manifest by the relatively small number of syllabi and evidence of multiple contributors of original digital materials and the large percentage of links to external programs on the site. The peer-to-peer context of an active online community never seems to have materialized, since there are currently no registered users and the greatest number of participants online on any one day was extremely low.[54] Although the site distributes centralized information to prospective students and administrators managing transfer students efficiently, for some reason, chat groups and online fora have been more successful at other writing centers and online writing labs.[55]

**Linking Information Literacy and Pedagogical Community: The SPIDER Approach**

The SPIDER project (Shared Pedagogical Initiative: A Database of Electronic Resources for the UC Community) represented a fundamentally different model that attempted to include information literacy standards and a commitment to hybrid modes of education with an effort to use electronic media to improve the efficiency of learning outcomes and

to build community across departments, academic units, and job titles.   It grew out of the "Virtual Research" Project at UC Irvine and was initially slated to be expanded to UC Riverside and UC Santa Barbara before the centralized funding from the UC Teaching and Learning with Technology Collaborative Grant program ended, although the components of SPIDER housed in original writing courses at UC Irvine continue to flourish, as the growth in the number of HTML pages, contributors, and users attests.

The first Virtual Research project began at the end of the 1998-1999 academic year, while Google was still in Beta and many different search engines were being used by students (Yahoo, Alta Vista, Lycos, etc.) with generally incoherent results. Top results rarely went to official sites, and logical outcomes of a search were often diverted by paid sponsorships or manipulative HTML tags. Search engines were already shaping student behavior. With access to the Internet, some were coming to class with more detailed information than those who had prepared by reading the introduction, notes, and appendices that provided the supplementary interpretive apparatus previously available from a critical edition of an undergraduate text. Unfortunately, other less critically inclined students were coming to class with misinformation and wildly idiosyncratic opinions derived from websites. One informal survey of students enrolled in one class, Writing 39C, revealed that many undergraduates believed that hoax websites were legitimate sources of scientific and policy information, even when the survey included a site about mutants in the community designed to promote the movie *X-men.*

This initial Virtual Research collaboration was based on a partnership between two writing program administrators in separate programs that fulfilled the same freshman/sophomore writing requirement: one was a course director of the "Argument and Research" course that completed the lower-division composition sequence (Ellen Strenski), and the other was the writing director of a year-long Humanities interdisciplinary "core" program (myself, Elizabeth Losh), which provided a parallel writing curriculum.[56]   Jointly, our large-enrollment courses served a diverse population of almost 5,000 undergraduates a year, the majority of whom owned a personal computer, according to a campus-wide information readiness survey, although they also came predominantly from households in which a language other than English was spoken, like many in Southern California.

Essentially, our thought experiment was this: what if you targeted the entire freshman class with an ambitious information literacy curriculum while also creating an environment for collaborative practices around technology among instructors? Although at the time, conventional wisdom emphasized a go-slow approach in which instructional technology funds were to be expended only on a test basis in rarified courses with specialized content, we believed that large-enrollment courses in composition would reach the most students the fastest – in the critical first year – and would educate the largest population of educators by virtue of relatively small student-to-teacher ratios.[57] After consulting campus librarians, the project expanded beyond its initial mission, which was merely to assist students with interpreting results from search engines and evaluating the authority of websites. The final product of the Virtual Research Project was housed on mirror sites (<http://eee.uci.edu/faculty/strenski/research> and <http://eee.uci.edu/faculty/losh/research>) and served as a virtual textbook on research skills that included finding, interpreting, and integrating both print and electronic sources into a research paper.
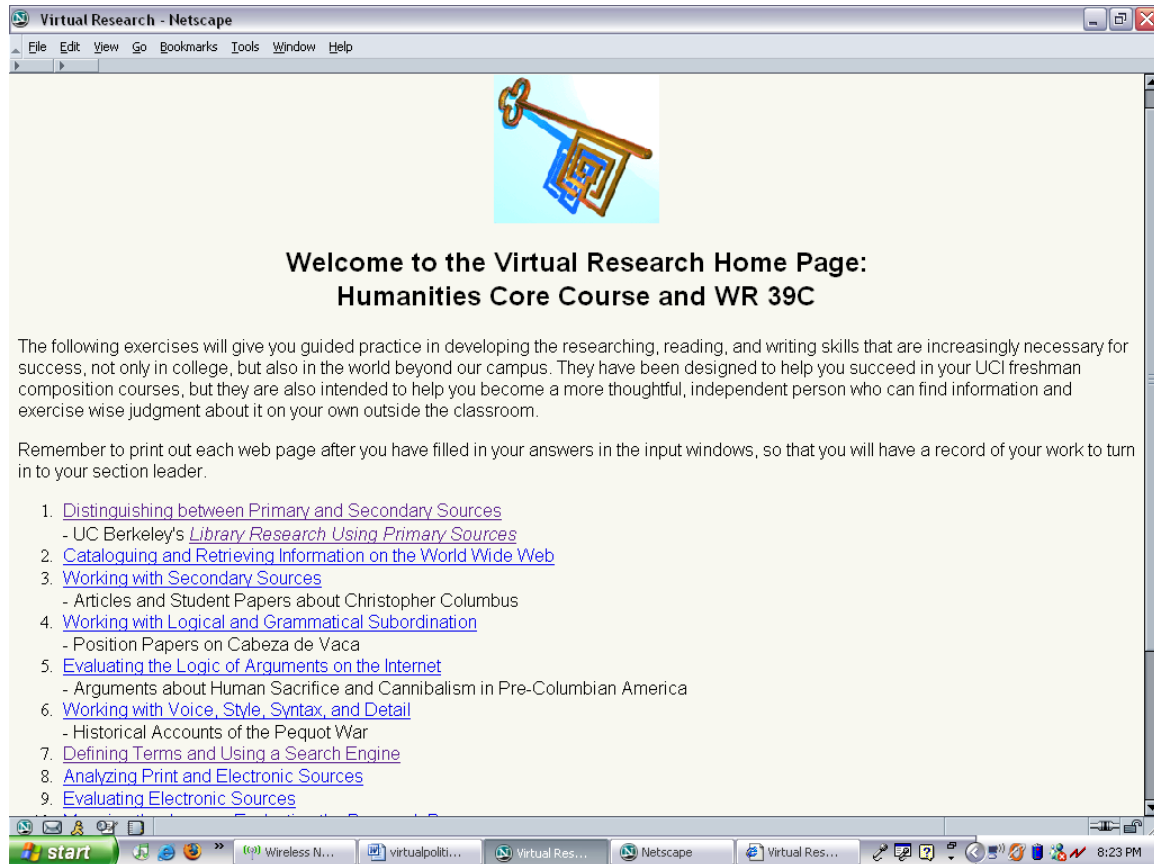
Figure 1: The First Virtual Research Project (1999-2000)

In the following 1999-2000 academic year, both writing program administrators collaborated again by creating instructional archives for each course to preserve what would otherwise be pedagogical ephemera and to build a more flexible and collaborative electronic "teacher's version" of the writing curricula. Writing 39C and the Humanities Core Course had already developed course web pages for students, but these new sites were intended to serve the heterogeneous audience of their instructors, who came from several departments and varied widely in their years of service in the classroom.

For many years, "good stuff" files had stored paper copies of exemplary in-class exercises, handouts, and quizzes that modeled best practices in the teaching of rhetoric and composition. Unfortunately, with so many instructors using these files, the most popular materials were often lost and misfiled, and it was inconvenient for each instructor to modify and retype documents. With the development of electronic mailing lists for instructors to supplement weekly staff meetings in unmoderated follow-up discussion online, particular classroom strategies could be disseminated more quickly; these mailing lists formed the core of the next generation of supplementary instructional materials. Eventually instructors also began to design materials that originated as HTML documents, which used links to digital collections, electronic image files, and simple interactive programming. Virtual Research II incorporated and organized all these instructional documents as hypertexts, so that materials could be retrieved from an author index or as part of a particular course module in the syllabus. Unlike the ostensibly decentralized peer review systems of MERLOT and CPR, these proto-

SPIDER sites used a model similar to the one that was ultimately adopted by UCWRITE, one in which writing program administrators formally served as editors or, in the case of Writing 39C, on an "editorial board," to decide which webpages best represented the curricular goals of the course. Yet these proto-SPIDERs also produced a phenomenal amount of pedagogical content, compared to the other programs, because they were built on the bazaar model and benefited from both lively face-to-face and online exchanges, which engaged the energies of instructors teaching in over a hundred different classrooms at a time.

The Virtual Research pedagogical philosophy also required the intensive use of digital collections by students as an integral part of reading and writing assignments, so that young researchers could see the larger architecture of electronic archives rather than only glimpse discrete disconnected documents returned by a Google search. To encourage the development of scholarly research skills, freshmen were provided with sophisticated lexical tools that in the past had only been utilized by a rarified cadre of professional experts. To us, it seemed clear that there were obvious advantages to integrating searchable electronic text in compositional activities. Although one cultural cliché derided a generation who merely superficially "surfed" the web, we observed that many entering students were eager to seriously engage in what Gregory Crane has called "deep reading" with hypertext, a practice that requires considerably more academic engagement for greater intellectual reward than the conventional genre of a "close reading" in traditional print. Furthermore, from our professional experiences, we knew that writing is a particularly powerful mode of learning and would make it possible for students to retain more information from the voluminous quantities of electronic text that they were being asked to interpret.[58]

Large-scale writing assignments at UC Irvine have included a range of digital collections since 1998. Humanities Core Course students used JSTOR; Project Muse; The Perseus Project; the Oxford English Dictionary Online; Britannica Online; Historical Abstracts; The Modern Language Association Index; America: History and Life; Bibliography of the History of Art; the Columbus site at Millersville University; the Cabeza de Vaca site at Southwest Texas State University; Liberty, Equality, Fraternity: Exploring the French Revolution; The Salem Witch Trials Documentary Archive and Transcription Project at the University of Virginia; and Historical Newspapers. Students explored these digital collections in search of evidence to support arguments about literary explication, philosophy, history, rhetoric, and art history, and to conduct their capstone research project in the Spring. An even larger group of Writing 39C students was encouraged to use Lexis-Nexis Congressional Universe, Newsbank: America's Newspapers, Sociological Abstracts, Expanded Academic ASAP, and Business Source Premiere. As the later incarnations of the Virtual Research projects developed, we wanted to train students to exploit more from the vast resources of the California Digital Library that were available to them as members of the University of California Community.

At the same time, the inappropriate use of electronic text through cut-and-paste plagiarism was becoming a significant concern to us as course administrators who had to monitor the originality of intellectual property submitted for course credit and facilitate dialogue about the conventions governing authorship in the academy. As one recent survey of faculty indicated, instructors were actually defining academic dishonesty by the nature of the technological tools employed by students, specifically in terms of practices involving cutting and pasting.[59] Given the advantages of an online interface that would

take the instructor directly to links to potentially unattributed source texts and thus the full context of the student's effort to incorporate and acknowledge sources, founding members of SPIDER encouraged the university to license the www.turnitin.com plagiarism-detection software from iParidigms. Although initially seen as a policing action, the larger conversation and a number of supporting teaching colloquies and informational sessions emphasized appropriate forms of academic collaboration and guidance away from unauthorized practices in the new matrix that combined reading and writing.

Expanding the existing partnership between writing program administrators to form a triumvirate with the head of Education and Outreach of the UC Irvine Library, Catherine Palmer, was a logical development from this standpoint. As James K. Elmborg has pointed out, librarians and composition instructors already share much common ground.[60] By virtue of their interdisciplinary orientation, library instruction and writing instruction face similar obstacles to finding an established role in the university curriculum. These units are also deemed to be responsible for assessing and meeting particular concrete student learning outcomes. Unfortunately, both types of instruction are often seen as either offering remediation (teaching skills that students should know before entering college) or inoculation (teaching skills in a single session with permanent results).

Although these collaborative projects that joined information literacy instruction with writing instruction reached the entire entering class, with only a few minor exceptions, we were still concerned about transfer students who generally came to the University of California from community colleges. This was a student population who had not learned about the resources of the California Digital Library or had received explicit instruction about the appropriate acknowledgement of content derived from electronic texts. Yet these students formed a significant percentage of those who would be enrolled in upper division writing courses in individual disciplines and ultimately receive UC Irvine diplomas. Consequently we developed a website for these potentially underprepared students, so faculty could assume that they had avenues to acquire the same forms of digital literacy as their peers who had completed the first-year curriculum. This site received local campus funding from an instructional improvement initiative as "Virtual Research III" for transfer students.

Figure 2: Virtual Research III for Transfer Students (2000-2001)

Shared communal investment in information literacy activities fosters broader access to more of the resources of a research university and models how scholarly discourse is constructed. All students in Humanities Core complete a year-long curriculum on research methods, and to guide instructors and their students through the research process, campus librarians serve as curricular consultants and co-author assignments on research methodology with writing faculty. These "Discovery Tasks" provide students with on-line worksheets in library skills that are directly related to reading and writing assignments. In addition to expanding the sheer amount of primary and secondary material available to the students, these six on-line research assignments provide self-paced instruction in research methods outside of class, thereby allowing instructors to focus class-time on how to use and critically evaluate the material rather than simply how to find it. In Writing 39C, each section participates in a research skills session taught by a librarian with students sitting at a keyboard and receiving corrective feedback from both the writing instructor and a campus librarian. The learning goals for the research skills sessions are ambitious, as are the librarians' goals to include active learning, group work, and a hands-on exercise in these fifty-minute sessions.

Although Stanley Chodorow once proclaimed that the advent of digital resources would bring about the end of the era of great libraries,[61] we have found that the physical space of the traditional library as a site of teaching and learning has been revitalized by electronic research tools. This can be explained by the fact that many programs that integrate instruction in the use of digital collections commonly move through three

phases. In the *supplementary model*, electronic resources improve upon traditional paper indexes and finding aids to help users find library materials. In the *substitutive model*, electronic resources solve problems of access posed by the physical archive and preserve documents from the rigors of use by large populations of novice users. In the s*ynergistic model*, electronic resources encourage users to exploit the physical archive, and traditional codices and service personnel suggest new search strategies with digital materials. In the Humanities Core Course, many students actually used the traditional library *more* when assignments incorporated research in digital collections, particularly among the top echelon of students nominated for prestigious undergraduate prizes.[62]

The digital collaboration also improves conventional literacy by giving explicit instruction in recognizing (and even reproducing) conventions of print genres as more students discover and analyze the rhetorical and historical context of paper materials from the physical archive. Librarians at UC Irvine developed hands-on materials inspection exercises for both courses. In the Humanities Core Course, students examined envelopes containing political pamphlets from the McCarthy era from the Special Collections archive and were asked to identify issues, biases, and persuasive techniques employed in the documents.[63] In Writing 39C, in conjunction with reading and researching claims in Barbara Ehrenreich's *Nickel and Dimed*, students at tables were given boxes with different types of materials, in different genres, addressed to specialized audiences. In both variations of this exercise, students enjoyed the detective work of interpreting complex clues from unfamiliar documents and sharing their findings with others, so that a lively discussion based on student-centered learning ensued.

In the 2001-2002 academic year, the SPIDER project was formally launched and work began to expand the earlier Virtual Research projects and their corresponding course-specific library instruction modules to include the other lower-division writing classes in the composition sequence at UC Irvine.[64] During the SPIDER grant period, all lower-division writing courses at UCI produced course websites of curricular materials for use by students and instructors, more than doubling the total number of documents bound for the SPIDER database. These more traditional composition courses, Writing 39A and Writing 39B,[65] provided a stream of new raw materials in the form of hundreds of HTML files for the prototype SPIDER database itself. More than 1,000 individual files of UC Irvine-developed library use assignments, reading assignments, handouts, quizzes, discussion questions, worksheets, pedagogical tips, instructions for students, small group exercises, course grading rubrics, sample student papers, etc., were collected from these UCI lower-division writing course Web sites to form SPIDER.

Figure 3: The SPIDER Page (2001-2002)

It soon became apparent that the greatest immediate challenge to the project would be establishing a workable taxonomy, since different course cultures and faculty from different disciplines characterize "material types" and "pedagogical uses" differently. As Diane Harley has discovered in her own research on digital collections, it can be difficult for groups of academic users to agree on a common terminology to describe the features and products of electronic archives. In SPIDER, this problem was compounded, because we discovered that everyday synonyms for course ephemera were often not completely congruent for purposes of generating consistent search results. And some materials were selectively perceived as subsets of others, while other groups perceived them as mutually exclusive. In consultation with the web designer hired specifically for this purpose and team librarians, the SPIDER team created special metadata keyword categories for the learning materials in its searchable database.[66] They also consulted on design for an electronic form that was developed to enter metadata for each pedagogical document. Finally, for test audiences at UC Riverside and UC Santa Barbara, the SPIDER team designed various prototype search functions for the database (by pedagogical use, type of document, author, related reading, subject area, document title, course or student level) and designed a document template to standardize the "look" of all SPIDER documents, regardless of their specific origin.[67] Formalized editorial procedures for soliciting and peer reviewing new material were drafted, modeled on both the OLE ("Online Learning Exchange") in the California Virtual Campus and on procedures in MERLOT for "Submitting an Assignment" and "Contributing Material to MERLOT."

The success of SPIDER within the UCI campus community[68] has to do with a series of choices: bazaar rather than cathedral, lifeworld rather than system, and the promulgation of information alongside knowledge. But the most important choice may have had to do with the inclusion of those who were initially resistant to technological enhancement of the teaching of lower-division writing. Castells has argued that increasingly networked "informational societies" are ironically characterized by "the preeminence of identity as their organizing principle," which he defines as "the process by which a social actor recognizes itself and constructs meaning primarily on the basis of a given cultural attribute or set of attributes to the exclusion of a broader reference to other social structures."[69] In other words, the more that individuals are incorporated into transnational or interdisciplinary networks, the more these individuals resist by asserting traditional identity positions that redraw cultural boundaries. My colleague Ellen Strenski has defended the importance of the converse principle in academic culture: the resistance of individuals who assert their identity positions against technological initiatives in higher education can actually energize projects that would otherwise languish in the custody of technocrats; thus those who stand outside the collective, despite the coercive force of institutional authority, actually are vital to powering the circuits of intellectual exchange.[70] In my own experience, I have found that it is often the most determined, self-proclaimed "Luddites" – traditional instructors who only value chalk on the board and ink in the margins – who contribute the most ideas and observations to committee meetings and focus groups about the use of technology in the classroom. By using public discussion as a key venue in the development of SPIDER, opponents were included in the process and became advocates.

Regrettably, by the 2002-2003 academic year, state funds were no longer available to troubleshoot, refine, and expand these activities, and thus the prototype never reached the intended large-scale audience beyond the UC Irvine campus. The University of California Teaching and Learning with Technology Center halted plans to disseminate SPIDER more broadly to other UC campuses and believed that the program should receive low priority, given the fierce multi-campus competition for limited funds and impressive claims for global utility being made by CPR and UCWRITE. The "bazaar" development model of SPIDER was also poorly understood at the time by research scholars in the academic community who were accustomed to building cathedrals,[71] and little pressure existed for comprehensive information literacy initiatives from central administration.

Fortunately, SPIDER has had a second life. The program remains a model for faculty and instructional librarians as a model information literacy curriculum.[72] UC Irvine instructors continue to contribute to its large collaborative pedagogical websites, which now contain hundreds of lesson plans, suggested exercises, and hand-outs that provide materials to instructors to supplement the formal pedagogical training in the weekly staff meetings. To date, over 300 instructors and over 15,000 students have used SPIDER sites. These websites are grown and sustained by a lively electronic discussion list in which subject matter from the week is elaborated – and sometimes challenged – from the perspective of different fields and forms of disciplinary expertise. Collaborative administrative planning helps ensure a reasonable degree of consistency in teaching and grading across all of the sections, and the websites and mailing lists serve as the public arena in which different disciplinary expectations can be aired and coordinated to avoid potentially confusing contradictions as students move from one rhetorical context to another. The example of this collaboration demonstrates the value of allocating digital

resources to writing-intensive classes first rather than last, because these collaborations perform double duty for the university, particularly if the theoreticians of hypertext are correct that the very activities of reading and writing largely overlap in this new medium.[73]

Notes

[1] C.P. Snow, *The Two Cultures and the Scientific Revolution* (New York: Cambridge University Press, 1959) 4.

[2] Jane Fountain, *Building the Virtual State* (Cambridge, MA: The Brookings Institute Press, 2001).

[3] Definition from *Webster's Third New International Dictionary* online via Chadwyck-Healey database on the California Digital Library.

[4] Definition from the *Oxford English Dictionary Online* <http://dictionary.oed.com/> via the California Digital Library. See also John Seely Brown and Paul Deguid, *The Social Life of Information* (Cambridge, MA: Harvard Business School Press, 2000) 120, in which knowledge is defined by its relationship to a knower, while information is treated as a self-contained substance.

[5] Michael E. Horat and Zachary Schiffman, *Information Ages: Literacy, Numeracy, and the Computer Revolution* (Baltimore: Johns Hopkins University Press, 1998), 3.

[6] Claude Shannon, "A Mathematical Theory of Communication," *The Bell System Technical Journal* 27 (July and October 1948): 379-423 and 623–656.

[7] Although if no terminal letter appears in the second case, the reader might assume that a linguistic shift has occurred and the word "chocolat" comes either from another language or a nonstandard or idiosyncratic English dialect.

[8] Claude Shannon and Warren Weaver, *The Mathematical Theory of Communication* (Urbana: University of Illinois, 1949) 116.

[9] Dilip Goankar, "Contingency and Probability," *Encyclopedia of Rhetoric* (Oxford: Oxford University Press, 2001).

[10] Aristotle's treatment of probability and the probable in the *Rhetoric* further supports an information theory reading of his work. Although it does not explicitly discuss information theory, Thomas B. Farrell's *Norms of Rhetorical Culture* (New Haven: Yale University Press, 1993) provides in-depth analysis of Aristotle's presentation of contingency, reflection, and the horizon of necessity in the *Rhetoric*.

[11] For example, E.O. Wilson's *Consilience: The Unity of Knowledge* (New York: Knopf, 1998) expresses its Platonic character by asserting that the "ongoing fragmentation of knowledge and resulting chaos in philosophy are not reflections of the real world but artifacts of scholarship."

[12] By opening his explanatory essay in *Lingua Franca* with an epigraph from *Science and Relativism*, Alan Sokal decisively locates himself as a Platonist. His defense of knowledge against its perceived attackers can be seen in his parody article that appeared in *Social Text*. His tongue-in-cheek bibliography includes the following books to be mocked for explicitly foregrounding an interpretation of knowledge as contingent: *The Production of Scientific Knowledge*, *Knowledge and Social Imagery*, *The Ecology of Knowledge*, *Dislocating Knowledge*, *Toward an Anarchistic Theory of Knowledge*, *Wild Knowledge,* and *Whose Science? Whose Knowledge?*   See Sokal's work in "A Physicist Experiments with Cultural Studies," *Lingua Franca* 4 and "Transgressing the Boundaries: Towards a Transformative Hermeneutics of Quantum Gravity," *Social Text* 46/47 (spring/summer 1996): 217-252.

[13] Many contemporary treatises on higher education still assume that knowledge and information are not of comparable value to students and, by extension, to society. Clark Kerr's 2001 edition of his classic, *The Uses of the University*, relegates information to "information technology" that can never transform the "conservative" academy and lauds knowledge as "the invisible product" of the university and "the most powerful single element in our culture, affecting the rise and fall of professions and even of social classes, of regions and even of nations."   Despite the fact that Kerr acknowledges second thoughts about his 1963 optimism about the transformative potential of what he calls the "knowledge industry" and subsequently warns of the dangers of creating robotic "knowledge factories," he makes clear that knowledge is central to the nation's educational mission, and information is only at the periphery.   See Clark Kerr, *The Uses of the University* (Cambridge, MA: Harvard University Press, 2001).

[14] Jean François Lyotard, *The Postmodern Condition: A Report on Knowledge*, trans. Geoff Bennington and Brian Massumi (Minneapolis: University of Minnesota Press, 1984) 52.

[15] See websites at <http://inquiry.uiuc.edu/>, <http://www.bie.org/pbl/pblhandbook/intro.php>, and <http://www.pbl.uci.edu> for explanations of the pedagogical philosophies of these three types of initiatives.

[16] In criticism of these programs, it should be pointed out that relatively little attention is given to the issue of information design. Certainly, Shannon and Weaver were concerned with engineering redundancy into noisy systems. Fortunately, Edward Tufte's concept of the ethical and societal value of representing information accurately and efficiently, particularly through visual means, is now appearing in more writing and communication curricula.

[17] Project SAILS from Kent State University is a model of a large-scale information literacy assessment project. The assumption that these programs are needed because there is an information "overload" potentially represents another ideology of control,

however, as John Seely Brown and Paul Deguid argue in *The Social Life of Information* (Cambridge, MA: Harvard Business School Press, 2000).

[18] The contrast between the taxonomy of information literacy categories from the American Library Association at

<http://www.ala.org/ala/acrl/acrlstandards/informationliteracycompetency.htm> and an explanation and prototype of the proposed multiple-choice test from the Educational Testing Service at <http://www.ets.org/ictliteracy/> is instructive for this argument.

[19] See the issues involved in the formation of a committee at Harvard University to study the issue, which is described in Jeoffrey R. Young, "'Hybrid' Teaching Seeks to End the Divide between Traditional and Online Education," *Chronicle of Higher Education* (March 22, 2002). Accessed May 23, 2005 <http://chronicle.com/free/v48/i28/28a03301.htm>.

[20] Boyer Commission Report on *Reinventing Higher Education: A Blueprint for America's Research Universities* <http://naples.cc.sunysb.edu/Pres/boyer.nsf/>.

[21] Richard Lanham, "The Implications of Electronic Information for the Sociology of Knowledge." Accessed April 1, 2005 <http://www.cni.org/docs/tsh/Lanham.html>.

[22] These failures among faculty-directed initiatives are especially ironic, given the success of collaborative efforts by students around sites like <www.facebook.com> or <www.ratemyprofessors.com>.

[23] Michel Foucault, *The Archeology of Knowledge and the Discourse on Language*, trans. A. Sheridan Smith (New York, Pantheon, 1972).

[24] Clark Kerr, "The Idea of the Multiversity," *The Uses of the University* (Cambridge, MA: Harvard University Press, 2001) 1-34.

[25] Elizabeth Losh, "Going Digital: Rapid Introduction of Multiple Approaches to Humanities Technology in a Large Undergraduate Course." *Digital Evidence: Selected Papers from DRH 2000* (London: Kings College Office for Humanities Communication, 2001) 265-276.

[26] See Jürgen Habermas, *The Theory of Communicative Action, Volume Two. Lifeworld and System: A Critique of Functionalist Reason*, trans. Thomas McCarthy (Boston: Beacon Press, 1987) and "Actions, Speech Acts, and the Lifeworld," *Some Philosophical Problems Today*, Volume I, ed. G. Fløstad, (Dordrecht: Kluwer Academic Publishers, 1994).

[27] "Tenure and Promotion Cases for Composition Faculty Who Work with Technology" at <http://www.hu.mtu.edu/%7Ecyselfe/P&TStuff/P&TWeb/Introduction> presents discouraging data on this subject from a CCC sponsored study.

[28] As Lawrence Lessig characterizes the current situation of the vulnerable individual in cyberspace, the neutrality of code (both encrypted computer code and publicly archived legal code) can be used to facilitate regulation as much as it can be deployed for constructing discourses about civil liberties and participation in "free culture" through the replication and recombination of intellectual property. See Lawrence Lessig, *Code and Other Laws of Cyberspace* (New York: Basic Books, 1999). In his own exploration of the cultural dynamics of file sharing, fellow "copyleft" advocate Siva Vaidhyanathan refutes Lessig's neutrality thesis and presents a radical vision of competing political forces of anarchy and oligarchy that foreclose membership and decision-making in the polity of liberal democracy and sustainable social communities more generally. See

Siva Vaidhyanathan, *The Anarchist in the Library: How the Clash Between Freedom and Control is Hacking the Real World and Crashing the System* (New York: Basic Books, 2004).

[29] See the U.C. policy at <http://www.ucop.edu/ucophome/coordrev/policy/9-25-03policy.pdf>.

[30] As John Seely Brown writes, "To be, in Peter Drucker's terms, a 'knowledge worker' now seems much more respectable than being a mere 'information worker,' though for a while the latter seemed very much the thing to be." See John Seely Brown and Paul Deguid, *The Social Life of Information* (Cambridge, MA: Harvard Business School Press, 2000) 118. Alan Liu interprets this opposition differently in *The Laws of Cool: Knowledge Work and the Culture of Information* (Chicago: University of Chicago Press, 2004); Liu's knowledge workers are constricted by cubicles as well.

[31] CCCC Position Statement on Promotion and Tenure Guidelines for Work with Technology. Accessed November 18, 2004 <http://www.ncte.org/about/over/positions/level/coll/107658.htm>.

[32] See Robert Samuels, "Revealing Codes: Cognitive Mapping of Writing, Computers, and Grants at the Postmodern University," *Kairos* 7.3 (Fall 2002) <http://english.ttu.edu/kairos/7.3/binder2.html?coverweb/samuels/index.html>.

[33] Manuel Castells, *The Rise of the Network Society* (Oxford: Blackwell, 1996) 371.

[34] See the talk by Stuart Molthrop at the 2004 Computers and Writing Conference, "No More Literacies!," accessed June 12, 2004 <http://iat.ubalt.edu/moulthrop/talks/cw04/>, which argues that faculty need to be able to write code to participate in hypertext teaching and research and to avoid the implicit mechanisms of control of pre-packaged systems.

[35] See Gregory Crane and Jeoffrey A. Rydberg-Cox, "New Technology and New Roles: The Need for Corpus Editors," *Proceedings of the Fifth ACM Conference on Digital Libraries* (June 2000): 252-253.

[36] See Jeoffrey R. Young, "When Good Technology Meets Bad Teaching," *Chronicle of Higher Education* 51 (November 12, 2004), on "PowerPoint abuse" in the classroom.

[37] See the Digital Resources Study at <http://digitalresourcestudy.berkeley.edu/>.

[38] See Christine Hine, *Virtual Ethnography* (London: Sage Publications, 2000).

[39] Christine Borgman, *From Gutenberg to the Global Information Infrastructure* (Cambridge, MA: MIT Press, 2000).

[40] Eric S. Raymond, "The Cathedral and the Bazaar," *The Cathedral & the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary* (Sebastopol, CA: O'Reilly, 1999) 27-78.

[41] See <http://www.merlot.org>.

[42] Surprisingly, MERLOT has a relatively liberal statement about intellectual property rights.

[43] David R. Russell, "Writing Across the Curriculum in Historical Perspective: Toward a Social Interpretation," *College English* 52.1 (January 1990): 52-73.

[44] See <http://cpr.molsci.ucla.edu/>.

[45] For more on representing relative vividness and interactivity of different media, see Jonathan Steuer, "Defining Virtual Reality: Dimensions Determining Telepresence," *Journal of Communication* 42.4 (1992): 73-93.

[46] Carol Twigg, "Improving Learning and Reducing Costs: Redesigning Large Enrollment Courses," accessed September 11, 2000 <http://www.center.rpi.edu/PewSym/mono1.html>.

[47] See the CCC Position Statement on Teaching, Learning, and Assessing Writing in Digital Environments at <http://www.ncte.org/groups/cccc/featuredinfo/115775.htm> for the argument against automated writing assessment programs. The assertions in this document about the abhorrence of automated writing assessment have been recently challenged by developers of the Criterion C-Rater and E-Rater online writing assessment tools from the Educational Testing Service and MY Access! from Vantage Learning.

[48] Michael Schrage, *Serious Play: How the World's Best Companies Simulate to Innovate* (Boston: Harvard Business School Press, 2000).

[49] Richard Lanham, *The Electronic Word: Democracy, Technology, and the Arts* (Chicago: University of Chicago Press, 1993) 6.

[50] <http://www.ucwrite.org/philosophy.html>.

[51] <http://www.ucwrite.org/philosophy.html>.

[52] <http://www.ucwrite.org/firstyear/faq.html>.

[53] Bill Readings, *The University in Ruins* (Cambridge, MA: Harvard University Press, 1996).

[54] <http://www.writing.ucsb.edu/projects/ucwrite/phpBB2/index.php>.

[55] Many cross-campus composition listserves seem to have difficulty sustaining membership growth and struggle to overcome these initially anemic participation rates. See forums with consistently small logins and little posting, such as *The Writing Instructor Online* at <http://www.writinginstructor.com/forums/index.html> and the Colorado State University at <http://writing.colostate.edu/forum/> (despite CSU's success with the Writing Studio software suite on other campuses). When facing online

apathy, other programs have preferred the expediency of relying on one-way online newsletters like those produced by Purdue's otherwise thriving Online Writing Lab (OWL) at <http://lists.topica.com/lists/purdueowlnews/read>. The blog at <http://kairosnews.org/> and the WPA-L Listserv from the Council of Writing Program Administrators at <http://wpacouncil.org/wpa-l> are examples of more successful online communities. For an analysis of discourse on the WPA-L listserv, see Deborah H. Holdstein, "'Writing Across the Curriculum' and the Paradox of Institutional Initiatives," *Pedagogy* 1.1, accessed May 23, 2004 from Project Muse <http://muse.jhu.edu/journals/pedagogy/v001/1.1holdstein.html>.

[56] Informal social networks also played a role in this collaboration, because both writing program administrators carpooled together for a regular hundred-mile trip to campus during which they could share policy and program ideas. We were also inspired by the discussion of research technology in the Boyer Commission Report on Reinventing Undergraduate Education, encouraged by a campus-wide study of the informatics readiness of students, energized by the 1999 IFIP Working Groups conference on electronic educational environments that was held at UCI, and recognized by the 2000 Digital Resources in the Humanities conference in the U.K.

[57] For more on the more ambitious "go fast" approach, see Elizabeth Losh, "Going Digital: Rapid Introduction of Multiple Approaches to Humanities Technology in a Large Undergraduate Course," *Digital Evidence: Selected Papers from DRH 2000* (London: Kings College Office for Humanities Communication, 2001) 265-276.

[58] Janet Emig, "Writing as a Mode of Learning," *College Composition and Communication* 28 (May 1977): 122-28.

[59] "Faculty Perceptions of Plagiarism," *Journal of College and Character* 2 (2005), accessed May 1, 2005 <http://www.collegevalues.org/articles.cfm?a=1&id=1417>.

[60] James K. Elmborg, "Information Literacy and Writing across the Curriculum: Sharing the Vision," *Reference Services Review* 31.1 (2003): 68-80.

[61] Stanley Chodorow, "Scholarship and Scholarly Communication in the Digital Age," *EDUCAUSE Review* 35 (January/February 2000): 86-92.

[62] See Elizabeth Losh, "Reading Room(s): Building a National Archive in Virtual Spaces and Physical Places," *Literary and Linguistic Computing* 19.3 (September 2004): 373-384 for how this counterintuitive increase in the use of physical archives with access to digital collections has also occurred in the large scale experience of national library initiatives.

[63] This exercise was developed by Bill Landis of the U.C. Irvine Special Collections archive, who is now affiliated with the California Digital Library.

[64] Professor Michael Clark and Composition Director John Hollowell were the principle investigators on the grant project.

[65] Course directors Ray Zimmerman and Carla Copenhaven supervised the web development of appropriate content and the Director of Articulation and Mentoring, Erika

Flesher, coordinated administrative and instructional stakeholders to create a coherent product with web designer Jennifer Cool. After the SPIDER project, Flesher embarked on a Ph.D. program in Clinical Psychology, and Cool continued her work toward a Ph.D. in Visual Anthropology.

[66] <http://e3.uci.edu/programs/spider/specs>.

[67] <http://e3.uci.edu/programs/spider/ucsb/mock-4step.html>.

[68] The SPIDER master site received almost one million hits in the five months after its launch in February 2002. The websites for the individual writing courses developed through SPIDER received over a million hits in 2001-2002. Over 150 people from all academic ranks contributed materials and over 1,000 individual web pages of instructional material were collected during the grant period.   Over 100 people participated in user feedback sessions and focus groups about the user interface. In one survey, the following results were reported: 84% of instructors in the Humanities Core Course and 77% of instructors in the Writing 39 series agreed with the statement "The staff site improves the quality of teaching materials developed"; 84% of instructors in the Humanities Core Course and 77% of instructors in the Writing 39 series agreed with the statement "The staff site reduces the amount of time spent preparing for class"; 90% of instructors in the Humanities Core Course and 66% of instructors in the Writing 39 series use staff sites at least once a week; 96% of students in the Humanities Core Course use the student site at least once a week; 86% of students in the Writing 39 series use the student site at least once a month.

[69] Castells 22.

[70] Ellen Strenski, "Fa(c)ulty Wiring? Energy, Power, Work, and Resistance to Technology," *Insurrections: Approaches to Resistance in Composition Studies*, ed. Andrea Greenbaum (Albany, NY: SUNY, 2001) 89-117.

[71] See also Ellen Strenski, "Disciplines and Communities: 'Armies' and 'Monasteries' and the Teaching of Composition," *Rhetoric Review* 8.1 (August 1989): 137-146.

[72] See the Dartmouth Web Teaching Case Study at <http://www.dartmouth.edu/%7Ewebteach/cases/losh.html>.

[73] Michael Joyce, *Of Two Minds: Hypertext Pedagogy and Poetics* (Ann Arbor: University of Michigan Press, 1995); Nancy Kaplan, "Literacy Beyond Books: Reading When All the World's a Web," *The World Wide Web and Contemporary Cultural Theory* (New York: Routledge, 2000); and George P. Landow, *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Baltimore: Johns Hopkins UP, 1992).